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# RADIO COMMUNICATION

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## HEARINGS

BEFORE  
U.S. ~~Senate~~, House,  
THE COMMITTEE ON THE  
MERCHANT MARINE AND FISHERIES.

HOUSE OF REPRESENTATIVES  
SIXTY-FOURTH CONGRESS  
SECOND SESSION

ON

## H. R. 19350

A BILL TO REGULATE RADIO COMMUNICATION

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### PART 1

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JANUARY 11, 12, AND 13, 1917



WASHINGTON  
GOVERNMENT PRINTING OFFICE  
1917

COMMITTEE ON THE MERCHANT MARINE AND FISHERIES.

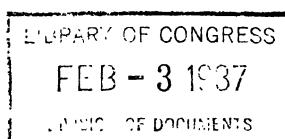
HOUSE OF REPRESENTATIVES.

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MICHAEL E. BURKE, Wisconsin.	DAVID H. KINCHELOE, Kentucky.
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## RADIO COMMUNICATION.

HOUSE OF REPRESENTATIVES,  
COMMITTEE ON THE MERCHANT MARINE AND FISHERIES,  
Washington, D. C., January 11, 1917.

The committee met at 11 o'clock a. m., Hon. Joshua W. Alexander, chairman, presiding.

The CHAIRMAN. Gentlemen, I set to-day for hearings on House bill 19350, a bill to regulate radio communication, and invited the proponents of the bill to be present to be heard in support of the bill, and stated that the hearings would continue from day to day until they had been heard; that beginning on next Thursday those opposed to the bill might be heard. The text of the bill follows:

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That wherever used in this act the term "radio communication" shall be construed to mean communication by any electrical system or method without the aid of wire or other conducting connection; the word "apparatus" to mean machines, devices, and all other equipment used in radio communication; the words "transmitter" and "receiver" to mean the sending and receiving apparatus, respectively, used in radio communication; the word "radiogram" to mean any message, communication, or signal transmitted or received in radio communication; the term "radio station" to mean a place where apparatus is used for transmitting, or for transmitting and receiving, the signals used in radio communication; the term "Government land station" to mean any radio station on land or on a permanently moored vessel, controlled and operated by any department of the Government; the term "Government ship station" to mean a radio station on any ship of the Government controlled and operated by any department of the Government and not permanently moored; and the term "Territory of the United States" or the word "Territory" to mean any Territory, District, zone, insular possession, water, or other place subject to the jurisdiction of the United States, and not within any State.*

The word "person" as used in this act shall be construed to import both the plural and the singular and to include a corporation, copartnership, company, or association; and when construing and enforcing the provisions of this act, the act, omission, or failure of any director, officer, agent, or employee of such corporation, copartnership, company, or association acting within the scope of his employment or office shall in every case be deemed to be the act, omission, or failure of such corporation, copartnership, company, or association, as well as that of the person acting for or on behalf thereof.

Sec. 2. That radio stations are divided for the purposes of this act into the following classes:

First. Coastal station, a station on land or on a permanently moored vessel used for the exchange of correspondence with ships at sea. Coastal stations include (a) those open to general public correspondence and (b) those open to limited public correspondence. Coastal stations of class (b) transmit and receive public messages to and from certain stations only, which are designated in the license.

Second. Station on shipboard, a station on board any vessel not permanently moored. Stations on shipboard include (a) those open to general public correspondence and (b) those open to limited public correspondence. Ship stations of class (b) transmit and receive public messages to and from certain stations only, which are designated in the license.

Third. Commercial station, a land station used in the transaction of commercial business and not used for the exchange of correspondence with ships at sea. Commercial stations include (a) those open to limited public correspondence, (b) limited commercial stations, (c) special stations for transoceanic or transcontinental communication. Commercial stations of class (a) transmit and receive public messages to and from certain stations only, which are designated in the license. Limited commercial stations, class (b), are stations of private interest, and carry on a specific commercial service or services defined in the license; they do not transmit public messages to, or receive them from, other stations. Special stations, class (c), are open to limited public correspondence or not, as stated in the license.

Fourth. Experiment station, a land station of private interest actually engaged in conducting experiments for the development of the science of radio communication or the apparatus pertaining thereto.

Fifth. Technical and training school station, a land or ship station of private interest used for purposes of instruction in radio communication and training operators.

Sixth. Amateur station, a land station of private interest not covered by third, fourth, or fifth of this section, and not operated for financial profit. Amateur stations include (a) general amateur stations, (b) restricted amateur stations, which are within five nautical miles of a Government station, (c) special amateur stations, the operation of which seems likely to result in some substantial benefit to radio communication.

Seventh. Government station, a station controlled and operated by any department of the Government.

SEC. 3. That nothing in this act shall be construed to apply to the transmission or exchange of radiograms or signals between points in the same State, if said transmission or exchange shall not interfere with the reception of radiograms or signals from beyond the jurisdiction of the said State, or the effect thereof shall not extend beyond said jurisdiction.

SEC. 4. That no radio station other than those belonging to or operated by the United States shall be used by any person within the jurisdiction of the United States to transmit any radiogram by the apparatus and methods of radio communication, except under and in accordance with a station license or licenses issued by the Secretary of Commerce. Any person who shall operate any radio station in violation of this section shall be punished by a fine not exceeding \$500 for the first offense, and by a fine not exceeding \$1,000 or imprisonment for not more than one year, or both, for each offense thereafter; and any radio apparatus operated in violation of this section shall be subject to forfeiture.

SEC. 5. That the Secretary of Commerce shall approve the rates charged by all licensed stations open to public correspondence.

The heads of Government departments having jurisdiction over Government land stations and Government ship stations shall, in their discretion, so far as it may be consistent with the transaction of Government business, open such to general public business, and shall fix the rates for such service, subject to the control of such rates by Congress. Such executive heads shall arrange, each in his own department, and for stations under his own jurisdiction, for the transmission and receipt of commercial radiograms between land stations and vessels at sea, between land stations and licensed radio stations within the United States or any Territory thereof, and between land stations and radio stations under foreign jurisdiction, under the provisions of the London convention of nineteen hundred and twelve and future international conventions or treaties to which the United States may be a party. The receipts from such radiograms, less an amount not to exceed twenty-five per centum per annum for the necessary expenses of each department for the handling of such commercial business, shall be turned into the Treasury as miscellaneous receipts.

No radio station other than one belonging to or operated by the United States, or by the Government of the Philippine Islands, shall be operated on land or on a permanently moored vessel in the Philippine Islands, and no radio station other than one belonging to or operated by the United States shall be operated on land or on a permanently moored vessel in the Panama Canal Zone or in any territory of the United States in the West India Islands other than Porto Rico and the Swan Islands, or in the Pacific Ocean west of the one hundred and sixty-first meridian of longitude west of Greenwich and south of the fortieth parallel of north latitude.

Every Government land station and Government ship station shall have special call letters which shall be designated and published by the Department of Commerce in a list of radio stations of the United States.

Sec. 6. That after three months from the passage of this act and at any time within five years after the expiration of said three months, but not longer, the Government, through the Navy Department, shall have authority to acquire by purchase at a reasonable valuation any coastal radio station now in operation in the United States which the owner may desire to sell.

Sec. 7. That the station license required by section four hereof shall not be granted to any alien or aliens, nor to any foreign Government or representatives thereof, nor to any company, corporation, or association organized under the laws of any foreign Government, nor to any company, corporation, or association of which any officer or more than one-third of the directors are aliens, or of which more than one-third of the capital stock is owned or controlled by aliens or by a foreign Government or representative thereof, or by any company, corporation, or association organized under the laws of a foreign country; and a license shall become void if ownership or management of the station or apparatus shall be transferred to any alien or aliens or to any foreign Government or representative thereof, or to any company, corporation, or association organized under the laws of any foreign Government, or to any company, corporation, or association of which any officer or more than one-third of the directors are aliens, or of which more than one-third of the capital stock is owned or controlled by aliens or by a foreign Government or representative thereof, or by any company, corporation, or association organized under the laws of a foreign country. No company, corporation, or association to which a station license has been issued shall thereafter during the term of the license have any officer who is an alien.

A license shall not be granted to any station not in actual operation at the date of the passage of this act if in the opinion of the Secretary of Commerce the operation of the proposed station will seriously interfere with the operation of existing Government or licensed stations in the vicinity.

Sec. 8. That the station license prescribed by section four hereof shall be issued only in response to a written application therefor, addressed to the Secretary of Commerce, which shall set forth the following facts:

First. (a) If the applicant be a natural person, his name and address, the date and place of his birth; and if naturalized, the date and place of his naturalization.

(b) If the applicant be a partnership or association of natural persons, the foregoing data regarding each member thereof:

(c) If the applicant be a corporation, the date of incorporation and under what laws incorporated, the principal place of business of the corporation, the names and addresses of the officers and directors, a statement as to each officer, specifying his place of birth and the country of which he is a citizen, and, if a naturalized citizen of the United States, the date and place of naturalization, and a statement showing what proportion of the capital stock is owned or controlled by aliens, by foreign Governments or representatives thereof, and by companies, corporations, or associations organized under the laws of any foreign country.

Second. The ownership of the station and apparatus.

Third. The exact location of the station.

Fourth. The stations with which it is proposed to communicate.

Fifth. The purpose or purposes for which the station is to be used.

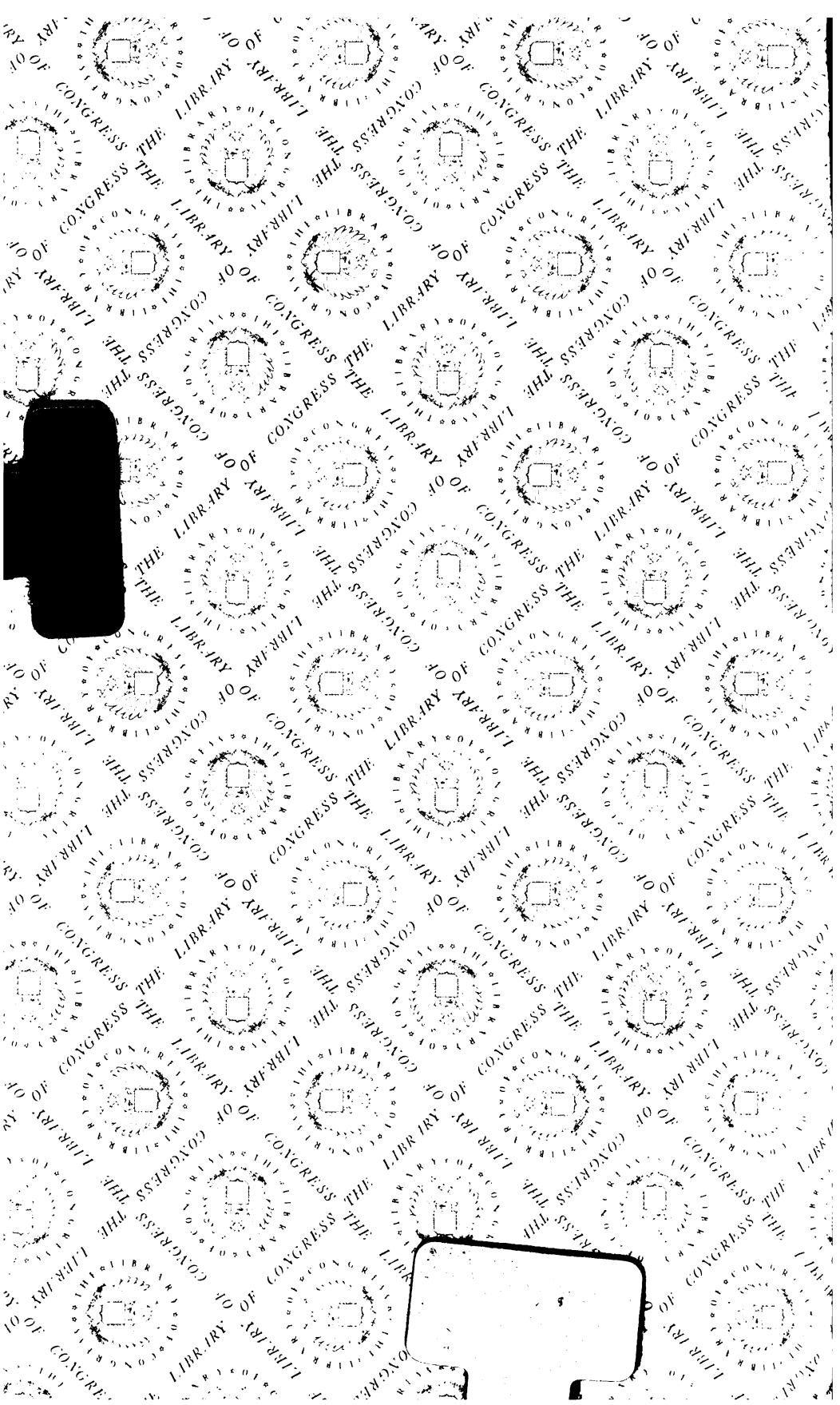
Sixth. The wave length or wave lengths which it is proposed to use at the station and the period or periods of the day during which it is proposed to operate the station.

Seventh. The proposed rate to be charged per word.

Eighth. Such further information as the Secretary of Commerce may, by regulation, prescribe.

Every application shall be signed by the applicant upon oath or affirmation. If the applicant is a corporation, the application shall be signed upon oath or affirmation by a duly authorized officer thereof.

The Secretary of Commerce may, upon request, determine in advance of the erection of a radio station, on the basis of an application substantially conforming to the requirements of this section, whether the apparatus to be installed in such station will be licensed upon completion of such station and upon what condition such license will be granted.



country of which he is a citizen, and, if a naturalized citizen of the United States, the date and place of naturalization. The application shall also state the previous experience of applicant in operating radio apparatus and such further facts or information as may be required by the Secretary of Commerce. Every application shall be signed by the applicant upon oath or affirmation. An operator's license shall be issued only to a person who, in the judgment of the Secretary of Commerce, is shown to be proficient in the use and operation of radio apparatus and in the transmission and receipt of radiograms. Except for the operation of a station on shipboard, an operator's license shall not be granted to any alien, nor shall such a license be granted to a representative of a foreign Government for the operation of any radio station. Whoever shall knowingly make any untrue statement in an application for an operator's license shall be guilty of perjury, and shall be punished by a fine not exceeding \$2,000, or by imprisonment for not more than five years, or both.

SEC. 13. That an operator's license shall be in such form as the Secretary of Commerce shall prescribe, and may be suspended by the Secretary of Commerce for a period not exceeding two years, upon proof sufficient to satisfy him that the licensee has violated any provision of this act or regulation of the Secretary of Commerce, or that he has failed to compel compliance therewith by an unlicensed person under his supervision, or that he has been willfully negligent, or has failed in carrying out the lawful orders of the master of the vessel on which he is employed, or that he has willfully damaged or permitted apparatus to be damaged. The license may be revoked by the Secretary of Commerce upon proof sufficient to satisfy him that the licensee was or is ineligible for a license.

SEC. 14. (a) That during any war in which the United States shall be a neutral nation, and in time of threatened or actual war in which the United States may be a party, and in time of public peril or disaster, the President may, by proclamation or Executive order, issue regulations for the conduct and censorship of all radio stations and radio apparatus of every form and nature within the jurisdiction of the United States. Any person who shall knowingly violate or fail to observe any of said regulations shall be punished by a fine not exceeding \$10,000, or by a term of imprisonment of not more than three years, or both; and in case of any such violation or failure to observe any of said regulations, the radio station, or apparatus, or both, shall be liable to forfeiture to the United States.

(b) The President further, in his discretion, may cause the temporary closing of any radio station within the jurisdiction of the United States and the temporary removal therefrom of any radio apparatus for a period or periods of not more than five months each, or may authorize the temporary use of the station or the apparatus thereof by any department of the Government for a like period or periods upon just compensation to the owners.

(c) Radio stations licensed under the provisions of this act shall at all times be subject to inspection by officials of the Department of Commerce.

SEC. 15. (a) That whoever shall maliciously or willfully interfere with or cause any interference with radio communication carried on or sought to be carried on by any radio station or apparatus shall be punished by a fine not exceeding \$500 for the first offense and by a fine not exceeding \$1,000 for each offense thereafter.

(b) Whoever shall willfully divulge or publish the contents, substance, purport, effect, or meaning of any radiogram, or any part thereof, to any person other than the sender or addressee thereof, or his agent or attorney, except to a telegraph or radio station employed to forward such radiogram to its destination, or to proper accounting or administering officers of the various communication systems over which the radiogram may have passed, or to the master of a ship on which he is serving, or in response to a subpoena issued by a court of competent jurisdiction, or on demand of other competent authority, shall be punished by a fine not exceeding \$500 for the first offense and by a fine not exceeding \$1,000 or imprisonment for not more than one year, or both, for each offense thereafter: *Provided*, That this section shall not apply to the divulging or publication of the contents of any radiogram by the sender or addressee thereof.

SEC. 16. That all stations shall give priority over all other radiograms to radiograms relating to ships in distress, shall discontinue all sending on hearing a distress signal, and, except when answering or aiding a ship in distress, shall refrain from sending until all radiograms relating to the ship or ships in distress shall have been completed.

Every coastal station and every station whose operation can interfere with the exchange of messages between ship and ship or ship and coast is required, during the hours it is in operation, to listen in at intervals of not less than fifteen minutes and for a period of not less than three minutes with the receiver tuned to receive messages on a wave length of 600 meters, or as may be required from time to time by future international conventions.

SEC. 17. That when sending distress signals the transmitter of a station on shipboard may be tuned to create a maximum of interference with a maximum of radiation. In all other circumstances all stations shall use the minimum amount of energy necessary to complete any communication.

Every radio station shall use such transmitting apparatus that the energy is radiated in as pure and sharp a wave as practicable and have a logarithmic decrement not greater than the limits which may be specified by the Department of Commerce, but the owner or operator of a station mentioned in section eighteen following shall not be liable to the penalties provided in section twenty-eight for a violation of the requirements of this paragraph unless such owner or operator, after having been notified in writing that the transmitter owned or used by him has been found, upon tests conducted by the Government, to be so adjusted as to violate said requirements, and after having been afforded opportunity for adjusting such transmitter to conform to said requirements shall have continued to violate the provisions of this paragraph.

Receiving apparatus shall be of such construction and so adjusted and used as to give the greatest practicable protection against interference.

SEC. 18. That general amateur stations shall not use a transmitting wave length exceeding two hundred meters or a transformer input exceeding one kilowatt.

Restricted amateur stations shall not use a transmitting wave length exceeding two hundred meters or a transformer input exceeding one-half kilowatt.

Special amateur stations are permitted to use any wave length less than six hundred meters and an amount of power not exceeding the limit which shall be specified in the license, provided the Secretary of Commerce is satisfied that such operation would not interfere with Government, commercial, coastal, or ship stations.

SEC. 19. That the Secretary of Commerce may, in his discretion, grant special temporary licenses to stations to permit the carrying on of tests with any amount of power or any wave lengths at such hours and under such conditions as will insure the least interference with the work of other stations.

SEC. 20. That commercial stations and technical and training-school stations shall not use a transmitting wave length of one thousand eight hundred meters nor any wave length exceeding six hundred meters unless it exceeds one thousand six hundred meters, except in special cases to be determined by the Secretary of Commerce. Such a station shall operate in such a manner as not to cause avoidable or unreasonable interference with Government stations or other commercial stations. Such a station shall not use any wave length between two hundred and six hundred meters if operation at such a wave length would, in the opinion of the Secretary of Commerce, cause interference with coastal or ship stations.

License shall not be granted to a commercial station not in actual operation at the date of passage of this act permitting the use of a wave length between two hundred and four thousand meters, except when so far removed from Government or coastal stations that in the opinion of the Secretary of Commerce no interference can occur with Government or coastal communications.

In considering complaints of interference and in deciding whether the license of a station causing serious interference shall be revoked by the Secretary of Commerce, preference shall be given to stations communicating with ships or between points where other means of communication are not available.

SEC. 21. That every coastal station and ship station shall at all times be ready to send and receive messages and signals on such wave lengths and of such wave character as are required by the existing or future international conventions, one of these wave lengths to be considered as the normal sending and receiving wave length of the station. Such stations may also use one thousand eight hundred meters in accordance with the international convention in force and such additional wave lengths less than six hundred meters or greater than one thousand six hundred meters as may be granted by the Secretary of Commerce. Every such station shall have its receiving apparatus so marked that the operator can quickly and conveniently adjust it to a receiving wave length of six hundred meters or other distress wave length that may be designated by future international conventions.

SEC. 22. That no licensed ship radio station when within fifteen nautical miles of a Government land station or a coastal station shall use a transformer input exceeding one kilowatt, nor when within five nautical miles of a Government land station or a coastal station, a transformer input exceeding one-half kilowatt, except for sending distress signals or signals or radiograms relating thereto.

The Secretary of Commerce may regulate or prohibit the use of the transmitters of stations on shipboard in harbors within the jurisdiction of the United States, as he may deem necessary.

SEC. 23. That no licensed land station in operation on the date of passage of this act within fifteen nautical miles of the Government receiving stations at the following points: Boston, Massachusetts; Newport, Rhode Island; Washington, District of Columbia; Charleston, South Carolina; Key West, Florida; San Juan, Porto Rico; Point Isabel, San Antonio, Laredo, and El Paso, Texas; Fort Huachuca, Arizona; San Diego and San Francisco, California; North Head, Tatoosh Island, and Bremerton, Washington, or of any Government station in Alaska, shall be licensed to change its equipment in any manner that will increase its interference with other stations, and no land station located within fifteen nautical miles of the Government receiving stations herein named, and not in operation on the date of passage of this act, shall be licensed for the transmission of public or commercial business by radio communication.

SEC. 24. That at all important seaports and at all other places where coastal stations operate in such close proximity to Government stations that interference with the work of the Government stations can not be otherwise avoided by the enforcement of this act such stations as interfere with the receipt of radiograms by the Government stations concerned shall not use their transmitters during the first hour of the day commencing at midnight, local standard time, nor during each alternate hour thereafter. The Secretary of Commerce may, on the recommendation of the department concerned, designate the station or stations which may be required to observe this division of time. The Government stations for which the above-mentioned division of time may be established shall transmit radiograms only during the first hour of the day commencing at midnight, local standard time, and during each alternate hour thereafter, except in case of radiograms relating to vessels in distress.

SEC. 25. That whoever, including any person in the service of the Government, shall knowingly transmit or publish, or knowingly cause to be transmitted or published, any false or fraudulent distress radiogram, or who, when engaged in radio communication, shall transmit or publish, or cause to be transmitted or published, any other radiogram for the purpose of defrauding or deceiving the Government shall be punished by a fine not exceeding \$2,000 or imprisonment for not more than five years, or both.

SEC. 26. That no person shall use or operate any radio apparatus on a foreign ship when within the jurisdiction of the United States otherwise than in accordance with the provisions of sections fourteen (a), fifteen, sixteen, seventeen, and twenty-two of this act, and all the provisions of said sections and penalties thereto attaching are hereby made applicable to such apparatus: *Provided, however,* That in no other respect shall anything contained in this Act apply to public vessels of foreign Governments otherwise than by a general proclamation of the President.

SEC. 27. That the office of Director of Naval Communications, established under the jurisdiction of the Navy Department, shall be charged with the accounting and payment of charges in connection with the settlement of international radio accounts as provided by the London radiotelegraphic convention of nineteen hundred and twelve, or as may be provided by future international conventions. The expenses involved in the settling of international radio accounts, not exceeding \$5,000 per annum, shall be borne by the United States.

SEC. 28. That in all cases of violation of any provision of this act for which no penalty is otherwise prescribed, or of any regulation of the Secretary of Commerce, the Secretary of Commerce may impose a penalty of \$100 upon the owner of the apparatus by means of which such violation was effected, or a penalty of \$25 upon the offending operator, or both, but such penalties may be reduced or remitted by the Secretary of Commerce in his discretion; and in addition the Secretary of Commerce may, in his discretion, revoke the station license of such owner and revoke or suspend the license of such operator, as provided in sections ten and thirteen of this act.

SEC. 29. That the Secretary of Commerce shall have power to enforce the provisions of this act by appropriate regulations through collectors of customs

and such other officers as he may designate; and said Secretary shall also enforce the provisions of such international radio conventions as have been or may hereafter be ratified or adhered to by the United States, except that provisions thereof relating to Government radio installations shall be enforced by the departments respectively controlling such installations.

The Secretary of Commerce is hereby authorized to mitigate or remit any fine, penalty, or forfeiture (other than penalty of imprisonment) incurred under the provisions of section four, section eleven, and subdivision (a) of section fifteen hereof, in the manner prescribed by law for the mitigation or remission of penalties for violation of the navigation laws.

SEC. 30. That, except as otherwise specifically provided in this act, the provisions of this act shall extend to all places subject to the jurisdiction of the United States. The several courts of first instance in the Philippine Islands and the district court of the Panama Canal Zone shall have jurisdiction of offenses under this act committed within their respective districts, and of conspiracies to commit such offenses, as defined by section thirty-seven of the act to codify, revise, and amend the penal laws of the United States, approved March fourth, nineteen hundred and nine, and the provisions of said section, for the purposes of this act, are hereby extended to the Philippine Islands and to the Panama Canal Zone.

SEC. 31. That the act approved August thirteenth, nineteen hundred and twelve, entitled "An act to regulate radio communication," is hereby repealed.

Such repeal, however, shall not affect any act done or any right accruing or accrued, or any suit or proceeding had or commenced in any civil cause prior to said repeal, but all liabilities under said laws shall continue and may be enforced in the same manner as if said repeal or modifications had not been made; and all offenses committed, and all penalties, forfeitures, or liabilities incurred, prior to the taking effect hereof, under any law embraced in, changed, modified, or repealed by this act, may be prosecuted and punished in the same manner and with the same effect as if this act had not been passed.

The CHAIRMAN. Hon. Newton D. Baker, Secretary of War, is present. He is a very busy man and, if there is no objection, we will hear him now, as he wishes to speak briefly in support of the bill.

#### STATEMENT OF HON. NEWTON D. BAKER, SECRETARY OF WAR.

Secretary BAKER. Judge Alexander and gentlemen of the committee, I have no technical information to place at your disposal—that is, personally; but I want, at the outset, to offer the services of the technical men in the Signal Corps, Col. Squier, Col. Wallace, and others, at any stage of the proceedings, for such information and help as they can give you.

This is not primarily a War Department measure, but it is one in which the War Department has two interests. In the first place, it coordinates with the Navy in the transmission of military information and, second, it looks forward, with the Navy, to the possibility of the country needing complete control and dominance of the wireless situation for the safety of the country.

The features of this bill which are of especial interest to the War Department are those which look to Government control and supremacy in the field of wireless operation. The Navy Department has urged that rather especially upon you, and will continue to do so. And I want to say that the War Department is in entire and hearty accord with the Navy Department in that desire. We believe, in the early stages of the development of this most recent of the advances in science, the necessity has already become clear of complete Government dominance and supremacy. The interferences and things of that sort are matters of technical concern; but the War Department is as one with the Navy in believing that now is

the time to establish the complete supremacy of the Government in this field.

The provision in the bill—I forget the number of the section—which authorizes the Navy to acquire private stations within the next five years, is the one, of course, of chief concern to us all. This bill has had the active assistance, in its preparation on some features of it, of a committee upon which the War Department was represented, Col. Wallace, of the Signal Corps, being our representative, and he assures me that from the military point of view it is approved in every respect by those who are dealing with wireless operation in the War Department.

If the committee, in your hearings, desire to have Col. Squier come down here, or Col. Wallace, it will give me very great pleasure to send them.

The CHAIRMAN. As I recall, Col. Squier was one of the experts who gave us the benefit of his knowledge when the committee framed the original act; in fact, he was one of the parties who assisted in framing it.

Secretary BAKER. I should think that entirely likely, although Col. Squier was in London until just a few months ago.

The CHAIRMAN. Yes; but the original act was framed and passed in 1912, I think.

Secretary BAKER. I do not happen to know whether he was in this country then or not.

The CHAIRMAN. I think he and Commander Todd were the experts who appeared before the committee when we framed that law.

Secretary BAKER. Col. Squier is here now and is available and will be very glad to come at your convenience, at any time.

The CHAIRMAN. Are there any questions of the Secretary?

Mr. HARDY. I do not know that it is pertinent, Mr. Chairman, at this stage of the proceeding, but I would like to have the Secretary tell us whether, in his opinion, an effective control of the wireless stations by the Government can be had in any way except by the ownership of those stations?

Secretary BAKER. I think not, sir. I think that is the only effective control.

Mr. HARDY. We are generally disposed to shy around that term "Government ownership," but in this case the only effective and complete control, in your opinion, would be ownership?

Secretary BAKER. I do not shy at the word; but quite apart from one's general attitude on that question, this, involving the national security of the country, as it does, seems to be separate from all other questions, or most other questions, of Government ownership and control.

Mr. HARDY. I noticed you did not use those words in your statement, and it occurred to me, just as you say, that is the only way to have complete dominance. I am not afraid to use the word.

Secretary BAKER. I like to deal with ideas rather than words, and when a word has gotten a bad reputation which it does not deserve, I sometimes avoid it.

Mr. HARDY. I thought its reputation was pretty bad. Assuming the Government should own these lines of communication by wireless stations, it would not be wise to cut out all private enterprise of the lines by absolutely forbidding their use, and the use of

wireless by private investigators and private inventors, but it is a question of whether or not you can frame a bill so as to permit progress outside of the Government and, at the same time, to give the Government complete control. What is your idea about that?

Secretary BAKER. It is very much like having two companies running railroad trains on the same track without complete control by one of the companies. Unfortunately, the transmission of wireless messages is a thing in which interferences are so destructive that unless somebody controls the means of transmission nobody can succeed in it.

Mr. HARDY. Would Government ownership, and of course control, of certain parts of this wireless system enable it to know all that was being done by a privately owned company?

Secretary BAKER. I am not quite sure I catch the scope of the question. If you mean whether the Government stations would be able to receive all messages sent from private sources and analyze and discover their character, I am not certain that is so.

Mr. HARDY. My aim was to know whether it would be necessary absolutely to forbid the private use of the wireless in order to assure the Government complete control.

Secretary BAKER. I do not think it is necessary absolutely to forbid private use of the wireless, but I think the proper plan is to make the Government establishments supreme in the field and to make the advantages of the Government facilities so great that private agencies would desire to withdraw in favor of the Government.

The CHAIRMAN. In other words, looking at it from the standpoint of national defense, the two can not occupy the same field in the event of war or public danger that would impair the national safety?

Secretary BAKER. I think that is unanswerable. To control the wireless, in the event of any superior emergency of the country, it would very likely be necessary—probably would be necessary—to close all private transmission machinery.

The CHAIRMAN. And not wait the event of war; but there are certain other conditions?

Secretary BAKER. It would be a very harsh thing to do, to wait for war to break out and then take over the commercial stations; it would be a very harsh thing to interfere with private interests. But as provided here, the commercial facilities would become an agency to our national defense, and then, if the Government should require them, it could take charge of them without harsh action against private interests.

Mr. HARDY. I do not know that I can get my idea clear enough to present to you, but what I want to do is to avoid the absolute closure of that field to private investigation and invention; to leave it so that private enterprise and invention and investigation could still operate, but, at the same time, retain the complete control by the Government, and domination, as you use it.

Secretary BAKER. I should be very hopeful that that could be controlled and have no doubt it can be; but as it involves technical questions, I am sure Commander Todd would be a better witness on that subject than I.

Mr. SAUNDERS. Is it the purpose of this bill that the Government shall exclusively operate radio agencies?

Secretary BAKER. No, sir; the bill does not say so, and it is not its purpose as I understand the purpose.

Mr. SAUNDERS. What is it? I did not gather from what has passed what the purpose of this bill is.

Secretary BAKER. I perhaps ought not to undertake a definition of it; but as I understand it, it is to provide for operation, through the Navy Department, of the coastal stations, placing the Navy Department in a position where private agencies will desire to transfer their operations to the Navy Department, ultimately leading to a monopoly in wireless transmission in the Government through the Navy Department.

Mr. SAUNDERS. Pending ultimate consummation of it, it is contemplated that private agencies may operate radio stations?

Secretary BAKER. I so understand the bill; yes, sir.

Mr. SAUNDERS. Does this look, then, substantially, simply to taking over in war time the absolute control of radio operation?

Secretary BAKER. I think not. I think it looks to beginning the taking of it over now under equitable and favorable terms to existing private interests and rather intends to discourage further building up of private interests in that field, except in a minor way it will lead to a further development of the art.

The CHAIRMAN. Commander Todd, will you direct the order in which those to speak in favor of the bill are to be heard?

#### STATEMENT OF COMMANDER D. W. TODD, UNITED STATES NAVY.

Commander Todd. Mr. Chairman and gentlemen of the committee, the bill before the committee was prepared by a committee of 14 members representing every executive department of the Government, including all of the nonmilitary departments, such as Interior, Labor, and Post Office. Every one of them had one or two members. Their deliberations have extended over a full year. This is the best the committee could do, but since we have offered this bill to this committee the Secretary of the Navy has come out flat-footed in a very strong indorsement of the bill plus the idea of Government ownership of all radio stations that do a commercial business; not only on the coastal stations as covered in this bill, but the purchase at this time of existing high-power stations and others that handle commercial business; with the idea that it is a military necessity and a form of preparedness, and because purchase at this time will save the Government a considerable amount of money, as it is something that must be done in the end. There is no escape from it from the point of view of the Navy Department.

Secretary Baker has affirmed those ideas very strongly here, and the term "Government ownership" is now on paper in good form.

This idea of the purchase of all stations handling commercial work, as I said, goes beyond the provisions of this bill. This bill is a comparatively mild measure, in that it suggests Government ownership, looks toward it, makes it clear that that is the idea of the committee and all of the departments concerned—that Government ownership is ultimately to result.

The CHAIRMAN. Commander Todd, it may be I should have asked you a question or two in reference to your connection with this whole subject. You are a commander in the Navy?

Commander Todd. Yes, sir.

The CHAIRMAN. How long have you been a student of the wireless art?

Commander Todd. For over three years, commencing in 1910; I was on duty in the Navy Department with duties solely in connection with radio telegraphy.

The CHAIRMAN. You are one of the experts who appeared before the Senate and House committees in 1912, when the radio act was passed of which this is an amendment, were you not?

Commander Todd. Yes, sir; except that I do not call myself an expert in the presence of so many able men around me whom I recognize. I had a great deal to do with the preparation of the act now in force.

The CHAIRMAN. As I recall, you and Col. Squier were both before this committee at that time.

Commander Todd. Yes; and also Mr. Chamberlain and many other gentlemen here present.

The CHAIRMAN. Yes.

Commander Todd. After a cruise at sea, I was ordered back to the same duty but in another capacity. I was ordered to succeed Capt. W. H. G. Bullard as head of the Naval Radio Service. I also succeeded him in the chairmanship of the interdepartmental committee which framed this bill.

The CHAIRMAN. And you are now head of the radio service?

Commander Todd. Yes, sir.

The CHAIRMAN. Proceed.

Commander Todd. I believe that the committee has by this time received, or is receiving strong indorsements of this idea of Government ownership from all the departments of the Government which took part in the framing of this bill; and if they are all as strong as the indorsement of the Secretary of the Navy, the Secretary of Commerce, the Secretary of War, the Secretary of the Treasury, and the Secretary of Labor, the committee will have something of more weight to work on than anything I can say here.

I should like to start back a few years and show the Government's connection with this subject of radiotelegraphy. In 1898 Mr. Marconi accomplished the unprecedented feat of communicating 20 miles over water at some yacht races at Cowes, Isle of Wight, England. Early in this century he came here and demonstrated the value of radiotelegraphy to the Navy Department and to other departments of the Government by experiments on some of the latest ships of the Navy at that time, notably the *Massachusetts* and *New York*. The paramount value of this invention for naval operations was recognized at the time and has been a matter of the greatest interest and value ever since; and in all I have to say here I will emphasize the necessity for legislation along these lines to increase the value of the radiotelegraphy for the defense of the country.

As soon as the value of the art was demonstrated, several departments of the Government started to put up stations. They soon discovered that the question of interference, not only with commercial interests, commercial ships, and naval ships, but with one another, was a very serious one, and they decided among themselves to give the Navy a free hand on the coast; the War Department to put up such stations as it needed for its own purposes and the Navy to furnish

communication with ships at sea and such other communications as other departments of the Government needed or might need.

At the same time commercial companies commenced putting up stations at the most prominent points around New York, Boston, Philadelphia, and other great ports, and gradually extended their systems. Rivals put up rival stations until there were altogether too many stations in any one district. This condition exists to this day.

Congress has always been very liberal to the Navy Department in the matter of furnishing money for erecting stations; and before 1906, or about that time, we had a system of stations on both coasts of the United States and in some of our outlying possessions. Wherever there was a naval station they provided a radio station, plus a number of others put up at prominent points along the coast for the safety of life at sea, for the collection of data for the Weather Bureau, for communication with Government vessels, and to issue storm warnings and other information of use in the navigation of ships. Through this liberality of Congress this system has gradually extended in the number of stations, especially covering Alaska, the Canal Zone, and the Pacific islands, pretty thoroughly.

Then Congress appropriated special money for high-power stations, of which we have two working, one to be opened this month and two others and two lesser ones—medium power—to follow during this calendar year. And with the increase of efficiency of apparatus the Navy Department has been enabled by generous appropriations to keep up with the progress in the art, has fitted up its stations with the latest apparatus, and is continuing to do so right along. The result is that we have run ahead of most commercial concerns in efficiency of apparatus and, we believe, in efficiency of operation.

There was no law governing radiotelegraphy whatever up until 1912. That is, six years after the Government stations were put up all stations were left to their own devices—were left to interfere with ships and with one another. But the increased use of Government stations made it plain that they must have their chance to work, and that commercial ships and stations must be protected from one another. In 1910 a bill was prepared and passed the Senate, I believe, was sent to the House, unanimously recommended, but was not reached on the calendar. It failed on account of lack of time. Nothing happened in the next year, but in 1912 the same bill came up and finally passed—a measure that has been administered very successfully by the Department of Commerce since then. I think it has been administered with great impartiality, and the commercial concerns who have operated under it and who opposed its passage are satisfied with it as it stands.

This present bill is an amplification of that. It is a smoothing out of certain features, a rearranging of the requirements, a clarification of the language and definitions, plus the idea of Government ownership, which I would like to touch on particularly as I reach the section containing it.

With your permission, Judge, I should like to go promptly through the sections and state what they are intended to cover.

The CHAIRMAN. I think that would be a proper way to proceed.

Commander TODD. Section 1 contains the definitions necessary to simplify the sections further on, especially the term "territory of

the United States," or "territory." It saves a lot of wording further on. Also the word "person" is defined in such a way as to make it apply to every person, corporation, or association of owners of stations.

Section 2 defines the different classes of radio stations in the United States. Radio communication is used for a number of purposes, some of them necessary and some of them unnecessary, but all existing, and all existing under regulations of the Department of Commerce, except the Government stations, ship and shore, which are under the control of the War, Treasury, and Navy Departments. The "coastal station" is a station that communicates with ships. We maintain as a matter of principle that ship to shore communication is the one most entitled to protection. Ships have no other means of rapid communication, while in other instances the land wires and cables can handle the work; and when there is any interference with ship-to-shore communication, overland or oversea communication steps aside.

I should like to go back and say that internationally this matter is covered by a convention signed in London in 1912.

The CHAIRMAN. How is that?

Commander Todd. I was speaking of the convention signed in London in 1912 and ratified by the Senate. It contains all the regulations necessary for smooth working between ship and shore; that is, between merchant ships and shore. And we, in ratifying that convention, have obligated ourselves to protect the ship to shore communication for ourselves and for the commerce of other nations.

The CHAIRMAN. When you extend or revise your remarks won't you insert in your hearing those provisions that are apropos in this connection?

Commander Todd. Yes, sir. This bill is based fundamentally on that convention, and the convention as a whole should go in as one of the appendices. There is hardly a paragraph in this measure that does not in some way rest upon the London convention. (See pp. \_\_\_\_.)

The next station, a station on shipboard, is one that we wish to encourage and help in every way we can. Our interest is in the operation of the shore end of the commercial work with ships.

The commercial station is defined as a land station which is not erected or not licensed to communicate with ships at sea. That may be a long-distance communication overseas in competition with cables, or may be, as it is in some cases, one or two on the Atlantic coast and one on the Pacific coast, where they are in competition with land lines.

Fourth is experiment stations, which allows the manufacturer of apparatus and scientific men to have their stations for testing and developing apparatus. This bill takes particular care that nothing shall be done to retard the art of radio communication.

Technical or training stations are of the same character. They are for the training of operators and for instructing the students of technical colleges in the art.

Sixth is the amateur station. The amateurs were regulated to a certain extent by the act now in force, and this bill does not in any way change their status. It does not restrict them or increase their activities. They have increased to enormous numbers. There are

over 5,000 of them; there may be many more—I have forgotten. They are working, regulated by the Department of Commerce, and are getting a lot of fun out of it, developing some operators and possibly some inventors; we can not tell.

Seventh is the Government station operated by any department of the Government.

The third section looks out for the interstate-commerce provision of the Constitution.

Section 4 requires a license for the station. That is in the old bill. It is also based on the London convention.

Section 5, based on the London convention, requires that the Government shall approve the rates to be charged by licensed stations. That is naturally a function of the Department of Commerce.

The second paragraph of section 5 is a very important one to the Navy Department.

Mr. HARDY. Do you think that section 5, the first paragraph of it, is ample to give the Government complete control over rates?

Commander TODD. Yes, sir; authority to approve rates. By the London convention each Government approves the rates of its stations, and the Secretary of Commerce is the one authorized in the act now in force, as also in this act, the radio laws of the country as far as commercial interests are concerned.

Mr. HARDY. This gives him the right to approve, but does not give him the right to fix any rates?

Commander TODD. That is it, sir. That possibly amounts to the same thing, and at present that is what the Department of Commerce is doing.

Mr. HARDY. They do fix them?

Commander TODD. Yes. A company wanting a license states the rates they propose to charge, and the Department of Commerce issues the license in accordance with that proposal.

Mr. HARDY. That would be all right as long as the rates proposed were approved, and there would be no trouble because both the Government and the private owner would act in cooperation.

Commander TODD. Yes.

Mr. HARDY. But suppose the Government found some rates were improperly high? Has there ever been a case where the Government has undertaken to reduce the rates or to fix the rates by the Government authority, contrary to the will of the owner?

Commander TODD. I would rather leave that for Mr. Chamberlain, who has that perfectly in hand.

Mr. EDMONDS. Is it true that the Government has the power to withhold a license?

Commander TODD. Not at present; no, sir.

Mr. EDMONDS. Or to withdraw the license?

Commander TODD. The Department of Commerce can withdraw the license for failure to observe the regulations or provisions of the act now in force.

Mr. EDMONDS. Then, in case the man did not observe the rate, he could withdraw the license, could he not?

Commander TODD. Yes, sir; if they were the rates once fixed. If the Department of Commerce once approved the rates and he attempted to raise them or even to lower them without approval, he

would be disobeying one of the regulations of the Department of Commerce and would be subject to a fine or a penalty or the revocation of the license, as provided by the act now in force.

At the bottom of page 5 the second paragraph of this section 5 is one of great interest to the Navy and will be the cause of considerable discussion before your committee. It has to do with the opening of Government stations to commercial business. There are now 23 Government stations of the Navy Department and several of the War Department open to commercial business; I think there are 7, 8, or 9 of the War Department stations which are open to commercial business. They work in the same way that the commercial radio companies are doing—communicating with the ships of the commercial companies and with the ships of all nations—and anybody who wishes to send a radiogram through those stations may do so; and they do that in addition to Government work. Wherever the Government work is heavy, certain stations handle it and certain other stations handle the commercial business. By the act now in force, approved in 1912, the Navy Department was authorized to open its coastal stations to commercial business where a commercial radio company did not maintain a full schedule, operating 24 hours of day; that is, where the commercial companies were not prepared to handle this work, the naval stations were allowed to do so. Also at certain strategic points, which you might call the frontier stations of the Navy—such as Key West, San Juan, Tatoosh Island, North Head, and San Diego, and the Alaska stations—the Navy Department was authorized to handle commercial business in any event. We have been doing that for four years now, and we think very successfully.

We have accounts with every department of the Government and with many of the bureaus of those departments, on account of the land line transmission involved. The Government messages carry no charge as far as the radio is concerned, but those radiograms must reach the radio station through the land lines or be delivered to destination by the land lines; and that involves accounts not only with the Western Union, the Postal, and all cable companies, but with the departments concerned for that land line transmission. We have accounts with every radio operating company, either those that have shore stations or those that have ships, or both. If a man-of-war has a commercial message from any member of the crew it must be sent to the nearest station; if that happens to be a commercial station it is sent through that station; or if a naval station open to commercial business is nearest, it is sent through the naval station, in the same way that the merchant ships send messages. They must, by the London Convention, be sent through the nearest coastal station so that they will not have to use high power to reach over to a distant station and thereby cause interference, which is a very wide subject.

We are now handling considerable commercial business. By "we" I mean the Naval Radio Service. We are handling the commercial business at many points on the coast, but do not do so north of Charleston, S. C., on account of the provisions in the present act, in that the commercial companies all maintain a full 24-hour schedule at strategic points north of Charleston. I mean "strategic" from a radio point of view. The opening of naval stations north of Charleston should be read in conjunction with the offer to buy the coastal

stations of commercial companies, as sounding the note of Government ownership of all such coast stations. It has been announced very definitely that the operation of coast stations as such is not a paying venture; that the stations, in other words, do not pay for themselves and that the money in the business comes from the monopoly of communication in any one part of the world, or all over a country where is can be obtained.

In the early days commercial companies one after the other started to get this monopoly. They wanted to get it through operating efficiency or through patents or through whatnot; and they have tried, in one place one company, another place another company, and sometimes both, and sometimes two or three companies have tried, to get this monopoly, and the confusion has been very great. The companies have sued one another and have tried to run one another out of business in one way and another. They have combined against one another and made new alliances. It is rather kaleidoscopic, and the same thing is going on now. We do not know where the commercial companies stand, whether they stand on their own feet or have alliances with another one. The upshot is that no one has been able to get this monopoly.

I do not know that it can be shown that the operation of shore stations does not pay, but from our experience the indications are very strong they can not pay. And ultimately I see—and I am talking for the Navy Department—the commercial stations withdrawing from the field because of this failure to make the operation of shore stations pay, especially if this bill goes through in this form, containing this measure. They can not compete with the Government. There is a monopoly right there, backed by tremendous capital, and the Government stations are furnished, through the liberality of Congress, with the best apparatus, and must take over the whole field in the end.

**Mr. EDMONDS.** Does the Government pay a royalty for the use of this patented apparatus?

**Commander Todd.** I can not answer that very definitely. I can say that we purchase the apparatus from the companies that offer it; but the Navy Department, for example, is not in a position to decide on the question of patent rights. And where there is a dispute the people who undertake to furnish the apparatus to the Government must fight it out among themselves or the Government may be sued by the party whose devices are used. The result is that the Government is now being sued by one of the commercial companies for the infringement of patent; that is, for buying apparatus from one of the companies which they claim have infringed their patents.

**Mr. EDMONDS.** The commercial companies and the Government are both on the same basis in using this apparatus?

**Commander Todd.** Yes, sir. There is no special protection to the Government. The Government may be sued in the Court of Claims, and is now being sued, as I said.

**Mr. EDMONDS.** I mean in the use of apparatus also, that the commercial company can buy the apparatus on equal terms?

**Commander Todd.** Yes, sir. Except that, generally, the Government has to pay more than any commercial company for the same apparatus.

Mr. EDMONDS. The Government does not make this apparatus, without paying any royalty or anything to the patenting companies?

Commander Todd. The Government does make some apparatus, sir. But I will have to leave it for some one familiar with that feature to state whether or not the apparatus manufactured by the Government does infringe any patents or whether or not the Government has made arrangement with those companies beforehand.

Mr. EDMONDS. Is the Government open to suit for infringement for use of a patent?

Commander Todd. Yes, sir; we are being sued now. All the departments of the Government that use radio apparatus are being sued. I think the amount is a million dollars.

The necessity for this measure, the Government ownership features, I should like to cover more fully later on and go on with the bill. This item would be a long step toward Government ownership; and I hope this item will be supplemented by others that will bring Government ownership very definitely and positively within a reasonable time.

The CHAIRMAN. What item is that to which you refer?

Commander Todd. This second paragraph of section 5, at the bottom of page 5.

Mr. HARDY. That paragraph brings out the fact, and your testimony on it, that this intermingling of Government and private ownership of the radio or operation produces infinite confusion of accounts and everything else connected with the service.

Commander Todd. Not accounts. The accounting is done on a very satisfactory basis. Our relations with commercial companies are very intricate. We are operating side by side with them, the commercial stations handling—

Mr. HARDY. I used the word "confusion" when I should have used the word "intricate."

Commander Todd. Intricate, yes.

Mr. HARDY. Of course if the accounts are kept straight there is no confusion, but it seems there is an intermingling of a thousand threads of cross currents.

Commander Todd. Yes, sir.

Mr. HARDY. Between these two different services in the same field; is not that the fact?

Commander Todd. Yes, sir; and interference and great duplication of effort, and sometimes what we call "fighting for the air," by the operators getting into aerial quarrels.

Mr. HARDY. I am talking simply about the fact of private ownership and Government ownership occupying or attempting to occupy the same field and attempting to operate exactly the same service.

Commander Todd. Yes, sir.

Mr. HARDY. Crossing at all times, at all angles?

Commander Todd. Yes, sir.

Mr. HARDY. If it were possible to place it in one control or the other, without engendering monopoly that would be oppressive, it would certainly be better than having these diverse controls?

Commander Todd. Yes, sir. If that point is strongly in the minds of everybody present, there is not much more to be said along those lines.

Mr. HARDY. That is what seemed to me your testimony on this part of the bill was likely to impress and what I gathered from it.

Commander Todd. Yes, sir; but I shall like further on to make that very much stronger and show a number of reasons why these two systems should not be operating side by side where there is this duplication of effort.

Mr. KINCHELOE. Would not complete Government ownership put the commercial companies out of business absolutely?

Commander Todd. No, sir. The only intent of this provision is to take from them the shore end of commercial communication. They still have the very broad field of development and manufacture of apparatus and selling to the steamship lines, selling to the Navy, furnishing apparatus and operators to the merchant ships on a rental basis, and selling to foreign governments.

Mr. KINCHELOE. Practically the only right they would have, then, would be to sell their discoveries and their products?

Commander Todd. To manufacture and sell apparatus, and operate it on ships.

Mr. KINCHELOE. Yes.

Mr. EDMONDS. As far as the present development by commercial companies engaged in radio telegraphy is concerned, it would put them out of business eventually?

Commander Todd. Yes, sir; except for ships, and for sale of apparatus.

Mr. EDMONDS. Of course, I mean as far as their shore business is concerned.

Commander Todd. Yes, sir.

Mr. EDMONDS. They would not be able to run their stations in competition with the Government after the Government had once furnished and finished a complete line of radio apparatus located in favorable locations?

Commander Todd. The Government has its own stations now. It does not propose any new stations except such as may be necessary in special cases and for military purposes. We are constantly improving, but we have the stations there now. What we are asking is for authority to open them up, and it is suggesting Government ownership in a way without saying it.

Mr. EDMONDS. Would it not have a very serious affect on the commercial cable companies' receipts from the radio business?

Commander Todd. No, sir. The overseas work is still young and there is not much competition yet. A great deal of competition is proposed. High-power stations, of which there are eight in this country already (a number of others proposed), work overseas in competition with the cables. And there will be money in that. And if they could work without interfering with the Government's high-power stations, in all circumstances, it would work all right. The inventors and scientists are promising us immunity from this interference, promising us more communication in a given area (and they are succeeding to some extent—the apparatus is very much improved), but we are still far from getting so that we can have a great number of communications. The field is limited, and for that reason they can not work many high-power stations without actual interference. That is the same broad subject, more can work when they are carefully organized as part of one system.

I should like to say here that our relations with the commercial companies are rather involved. We operate side by side with them and interfere with and worry each other. We handle accounts with them with the greatest smoothness and satisfaction.

Mr. EDMONDS. You are talking about commercial wireless companies?

Commander TODD. Yes, sir.

Mr. EDMONDS. I thought you were speaking about the commercial cable companies.

Commander TODD. No, sir; our relations with them are also very satisfactory, and with the Western Union and Postal.

We are urging commercial radio companies to manufacture apparatus and sell it to the Government. The Government has to pay good prices, because the field is limited. On the other hand, they are suing us for breach of patent, for buying apparatus other than theirs. So that the whole situation is extremely complicated, and, as other officers of the Government and representatives of commercial concerns come before you, the situation will look at times very confusing.

The last paragraph of section 5 simply prevents the extension of the commercial systems to United States territory other than that already covered by them. In the places mentioned, no more stations can be erected than are already there. The Navy Department has stations in all those places. The Canal Zone is well covered. The West India Islands have no commercial radio stations except one on the island of Porto Rico, and a fine one on Swan Island in the Caribbean. On the Pacific Ocean, the wording "West of the 161st meridian," and so on, means anywhere in the western part of the Pacific Ocean except in Hawaii. Hawaii is well covered already by an existing system, where, on account of cheapness, they use radio between the islands instead of laying cables.

The CHAIRMAN. How many companies have commercial wireless stations on the islands?

Commander TODD. Three, sir; the Mutual Telephone Co., which is a local system, connecting up the islands and communicating with ships; the Marconi Co. has communication with the California coast and with Japan through a Japanese Government station, and the Federal Telegraph Co., which has a large station for communicating with the California coast. The latter is the oldest, fairly reliable overseas transmission we know of. And the Navy will have completed, in this calendar year, a very high power station on the same small island with these three other systems.

The CHAIRMAN. They are all on the island of Oahu?

Commander TODD. The Mutual Telephone Company spreads all over the islands, but its principal station is on the island of Oahu; the Federal Station at Heeia Point; and the Kahuku Station of the Marconi Company. The last two are high-power stations.

Mr. EDMONDS. Do I understand that this puts the Marconi company out of business?

Commander TODD. No, sir.

Mr. EDMONDS. It controls the land line, though?

Commander TODD. Yes, sir; in a way. It permits all radio stations of the Navy to handle the shore end of commercial ship to shore communication.

Mr. EDMONDS. And does it leave open the number of small islands on the Pacific?

Commander Todd. No, sir; the Government will furnish such radio stations as may be necessary there. Samoa is covered. We are putting up a medium power station there. We have had a low-power station there for years. Guam is covered in the same way, and the Philippines is covered by the Philippines Government, by the War Department, and by ourselves. It practically means no commercial station in Guam, nor in that portion of the Hawaiian group west of the main group of islands, nor in American Samoa.

Mr. EDMONDS. It does not say that.

Commander Todd. The geographic limits marked out—west of the one hundred and sixty-first meridian of longitude west of Greenwich and south of the fortieth parallel of north latitude—covers that, sir. These limits exclude Alaska and the eight principal islands of the Hawaiian group.

Mr. EDMONDS. I thought you mentioned that exception because you had the exception of Porto Rico and Swan Island right ahead of it there.

Commander Todd. Other than Porto Rico and Swan Islands refers to the West Indies.

Mr. HADLEY. You say this limitation excludes Alaska?

Commander Todd. Yes, sir.

Mr. HADLEY. If the ultimate design is, and I understand it to be from your statement, to effect a Government monopoly absolutely, what is the purpose of making any exceptions now at all?

Commander Todd. As I said in the beginning, we, the Navy Department, and the War, Commerce, Labor, and Treasury Departments, have gone beyond this bill in advocating Government ownership. This suggests, in a very mild way, Government ownership. Now we feel strong enough to come out flatfooted and say that we believe in total enforced Government ownership, with the result that these exceptions should apply only until exceptions are all eliminated by purchase of the privately owned stations in the excepted localities. The stations in Alaska should be bought; those in Hawaii and those in the West Indies should be bought, very unquestionably and positively, as an urgent military measure of prime importance.

Mr. HADLEY. I understand that you are advocating the amendment of this bill so as to make that effective now?

Commander Todd. Yes, sir; I hope to see the bill amended to effect a complete Government monopoly within two years.

Mr. HADLEY. I want to get the theory of your statement, because it is not consistent with the bill, and I want to know just what you are coming to, as I may not be able to hear all of your statement.

Commander Todd. Yes, sir.

Mr. HARDY. As I understand your presentation of this last section here, it now embraces all territory not already occupied by commercial companies?

Commander Todd. Yes, sir.

Mr. HARDY. And prohibits the commercial entry, or the entry of the commercial companies, into that at present unoccupied territory?

Commander Todd. Yes, sir. They are ordinarily places that would not be profitable for commercial companies to extend into, except, possibly, for expensive, high-power stations; and the Government has its stations built or building at those places now. In case the Danish West Indies are acquired by this Government, one station for communicating with ships might be made profitable in time.

Mr. HARDY. This bill, however, as drawn is drawn so as not to affect the vested rights of companies in those places?

Commander Todd. Commercial companies have not extended into the places mentioned. Practically only the Atlantic seaboard north of Charleston is affected. We are handling commercial work already, by direct authority of Congress, at practically all other parts of the world owned by the United States.

Mr. HARDY. And what is the reason for those exceptions?

Commander Todd. Privately owned stations are already working in Porto Rico, in the Swan Islands, and in Hawaii. None of them are forced out of business by this bill. They may offer their stations for Government purchase within five years, as shown further on, but they are not required to sell out, or are they given any definite date after which they must cease to work.

Mr. EDMONDS. You mean before long they, no doubt, will offer their stations after this is in operation?

Mr. BYRNES. That is the object of it.

Commander Todd. That is, except for the high-power stations. I think they will favor a bill for the purchase of the coast stations.

Mr. HADLEY. Has any estimate been made of what it would cost to purchase those coast stations?

Commander Todd. Yes, sir. Naturally, it must be rough, because they do not give us any insight. We must estimate, as it were, from the outside. We have seen the inside of some of those stations.

Mr. HADLEY. Are you able, offhand, to give a rough estimate?

Commander Todd. For the coast stations, I should say, \$400,000. They are ordinarily not of a very substantial character. The average coast station has not the latest apparatus, has not high masts, is not prepared to stand tropical storms, and is liable to be put out of business. It has a limited range. It did not cost much in the first place. Most of them were put up originally for advertising purposes, to sell stock, and they do not represent much capital. Their earning power may be a question of investigation; but the station itself—the physical value of the station—is not much.

Mr. KINCHELOE. What per cent of the number and physical value of the radio stations is owned by the Government and what per cent by commercial enterprises now?

Commander Todd. In volume of business?

Mr. KINCHELOE. I mean of the number of stations and the value of them; not the business they are doing.

Commander Todd. I should have to estimate that, sir. But I should say that the stations operated by the Government—not for commercial purposes but of all kinds, do you mean?

Mr. KINCHELOE. Yes.

Commander Todd. I should say they are worth, at the very lowest, ten times as much as all the commercial stations in the country; and when we have the high-power stations working it will, naturally,

amount to very much more. I think that is a very conservative estimate, indeed.

Mr. EDMONDS. Your high-power stations cost about \$200,000 each, do they not, installed?

Commander Todd. They are costing more and more. The high cost of living has struck that branch, too.

Mr. EDMONDS. I mean we are appropriating \$1,000,000 to construct five stations, which would make the average cost of the five \$200,000 each?

Commander Todd. Yes; but they have been found to be costing more, and you are appropriating more money.

Mr. EDMONDS. That was two years ago?

Commander Todd. Yes, sir. I believe the station at Arlington over here cost around \$210,000.

Mr. BYRNES. The object of the bill is to establish a Government monopoly of this business, is it not?

Commander Todd. A monopoly of the shore end; not the ships.

Mr. BYRNES. The commercial end of it?

Commander Todd. Yes, sir.

Mr. BYRNES. To establish that either by purchasing from those who are now willing to sell or by our going into the business to force those not now willing to sell to acquiesce in that sale in a very short time, so that we will secure a monopoly of this commercial business? That is the way?

Commander Todd. Yes, sir; but I hope the committee will go beyond this bill and approve such provisions as will require the commercial concerns to sell out after a given time; to set a date, no matter how distant, as the committee may see fit, beyond which all stations of this character will not be licensed.

Mr. BYRNES. If that is your hope, can you not tell us what it will cost the United States Government to purchase these stations?

Commander Todd. I can only estimate, as I said.

Mr. BYRNES. What is your estimate of the cost to the Government of the purchase of those commercial stations?

Commander Todd. For the coast stations, \$400,000; for the eight high-power stations, over \$4,000,000, sir.

Mr. BYRNES. In all?

Commander Todd. For the eight high-power stations.

Mr. BYRNES. That is for the high-power stations?

Commander Todd. Yes, sir.

Mr. BYRNES. And therefore it would be at least four and a half million dollars?

Commander Todd. Yes, sir. That is very rough, indeed. For the high-power stations I have given a high estimate.

The CHAIRMAN. Are they worth more, on the average, than the station out here at Arlington?

Commander Todd. The average is higher.

Mr. BYRNES. For us to establish this monopoly, then, it means an expenditure of \$5,000,000?

Commander Todd. Yes, sir; at the outside.

Mr. BYRNES. At the outside?

Commander Todd. They would have to be appraised by experts to get a reasonable valuation.

Mr. HADLEY. In this estimate you are only estimating the value of the physical properties, are you not?

Commander TODD. No, sir; the good will, too.

Mr. HADLEY. And the rights?

Commander TODD. Not what the owners may claim are their earning powers, but a valuation on which somebody would ultimately be able to decide to be reasonable. The land values would require special investigation. If my estimates should prove to be low, it would be on account of my failure to appreciate the values of sites on which the high-power stations have been erected.

Mr. CHAMBERLAIN. To be determined by investigation?

Commander TODD. Yes, sir.

Mr. BYRNES. Do you mean this \$5,000,000 would put out of business all commercial stations, or would there be any exceptions?

Commander TODD. No exceptions. They would all be purchased.

Mr. EDMONDS. You only mean the coastal stations?

Commander TODD. No, sir; the high-power stations also.

Mr. EDMONDS. There is a high-power station in this country now?

Commander TODD. Yes; eight—two in Hawaii and six in this country.

Mr. BYRNES. That is only for the coastal stations?

Commander TODD. Plus the high-power stations, plus some that communicate overland.

Mr. BYRNES. What was the exception—I did not at first understand—about ships?

Commander TODD. We do not intend to interfere with the commercial working of ships, but to increase and facilitate their business in every way.

Mr. BYRNES. That is, between ships, or what?

Commander TODD. We have no interest in communication between ships, or between ship and shore, except in the shore end; that is, the commercial companies will still own and operate apparatus on ships. The working of ships among themselves, however, as well as their working with the shore, would be much improved if only Government stations were working.

Mr. BYRNES. But would have to communicate with the Government stations on shore.

Commander TODD. Yes, sir; we claim to their great advantage.

Mr. CHAMBERLAIN. But you have no interest offshore?

Commander TODD. We have no interest offshore, except as far as Government vessels are concerned.

Mr. HADLEY. The Government would control the private operation of the ship indirectly by virtue of its control of the shore stations?

Commander TODD. That is well regulated already, sir. That is in accordance with the London convention; the international convention covers the commercial working of all ships of all nationalities.

Mr. EDMONDS. Is that done by the countries in the convention?

Commander TODD. All the principal countries of the world, sir. I do not know the present details, but I think all those that were represented at the conference have ratified the convention.

Mr. EDMONDS. That takes in all of the principal countries?

Commander TODD. Yes, sir.

Mr. EDMONDS. Does it take in Japan?

Commander Todd. Yes, sir; and the South American countries and nearly every one of the European countries. A copy of the convention would show the signatory powers.

Mr. HARDY. Along that line Mr. Byrnes was asking about, this radio business is in its infancy, and if allowed by private enterprise to be continued for another 10 years, that \$5,000,000 would likely grow to \$20,000,000 that the Government would have to pay out at the end of 10 years from now?

Commander Todd. Oh, yes; because the number of high-power stations will surely increase after attention has been attracted to the success of the German high-power stations in this country.

Mr. HARDY. The point I am getting at is this: That ultimately, if the United States is going to have a monopoly in this business, the quicker she gets it the more economical it will be.

Commander Todd. This should have been done years ago. The foreign Governments, many of them, were farsighted enough to establish a monopoly from the first.

Mr. HARDY. Do you know what foreign Governments have established such a monopoly?

Commander Todd. I could name some of the principal ones, but it would be subject to correction. Germany, of course, France—

Mr. HARDY. I would like, when you correct your testimony, to have you put that in as best you can.

Commander Todd. I will try to get that, sir. I do not know now just where I am going to get it; but I think, later on, some gentlemen will appear who will have that at their fingers' ends. But in the European countries, where the Government does not retain a complete monopoly, the commercial stations are regulated so carefully that it is practically Government ownership. It amounts to the same thing.

Mr. KINCHELOE. If I understand you, your paramount reason for wanting Government monopoly is in the interest of national defense?

Commander Todd. Exactly so; that is the basis.

Mr. KINCHELOE. Have you any other reason except that?

Commander Todd. The question of mutual interference between the stations, which limits not only the amount of work which the Government can do but also that of the commercial people, the interference between the commercial people themselves, and the needless duplication of capital and effort.

Mr. KINCHELOE. Does that destroy the efficiency of the service, too—these conflicts?

Commander Todd. It does, sir. It destroys, to some extent, their efficiency and ours.

Mr. HARDY. There are two systems operating over one track without any central control?

Commander Todd. That is it, sir; and the best results for the Nation as a whole could be obtained only by establishing one management.

Mr. BRUCKNER. The wire is crossed, in other words?

Commander Todd. Yes, sir; you have some gentlemen here to-day who will probably tell you positively that with their devices it is quite possible to have as many conversations as there are telephone wires, or something like that. They have been saying that since

about 1909, but they have not yet been able to demonstrate the practicability of their devices. When they do, the Navy must have them. Still we have the interference; still these inventions are just about to be given to us. We get some and try them, and we still labor under the same difficulties to a great extent. Of course, there is a steady advance in efficiency of apparatus, of which radio communication does not get full advantage because commercial ships and stations do not get them promptly. The Government stations are always ahead.

The CHAIRMAN. As I understand it, your viewpoint is this: The Navy Department, or the Government through the Navy Department, has already established wireless stations at all strategical points on our coasts and in our insular possessions, or is in process of doing so. Those stations now can not only perform these services incident to the Navy, but all these services at a minimum cost to the public, and at far less investment of capital than by having this multiplication of service by different commercial companies. In other words, you can not dispense with the naval stations; and if we extend them and develop them, the same stations, apparatus, and operators can operate these other services as well?

Commander TODD. Yes, sir. Furthermore, the naval stations would be able to handle all Government business to better advantage. I do not say naval business only. That would come in strongly in the event we should, unfortunately, have a war. But the Government business as a whole, the business of all departments of the Government, would be handled far more efficiently if the Government stations handled all the commercial business, on account of elimination of interference and on account of the fact that the station that handles the greatest amount of business has the best operators. High operating efficiency comes only from constant operation, and the Government would profit very much along this line.

Mr. EDMONDS. Let me ask you a practical question: If war were declared by an Asiatic country against this country to-day, how would you get information into the Island of Guam?

Commander TODD. If war were declared now?

Mr. EDMONDS. Yes, sir.

Commander TODD. By Pacific cable.

Mr. EDMONDS. You would use the commercial cable?

Commander TODD. Yes, sir.

Mr. EDMONDS. You could not use the wireless for communicating with Guam?

Commander TODD. We expect to communicate with Guam by wireless in the near future.

Mr. EDMONDS. I thought the wireless at Guam only had a radius of about 600 miles.

Commander TODD. Yes, sir; it is very limited at present; a new station is being built. We expect this year to have it in communication with Pearl Harbor, where we have a large station now being erected, and also with Cavite.

Mr. EDMONDS. You are putting a larger one there, too?

Commander TODD. Yes, sir; a new station, which we have erected and equipped with the best apparatus that we can get at this time.

The CHAIRMAN. At that point, as a necessary step, the Govern-

ment would be compelled to take over the Marconi and Federal stations on the Island of Oahu, would they not?

Commander Todd. Yes, sir; to take over the stations on the Island of Oahu.

The CHAIRMAN. You would have to take them over as a military necessity in the event of a war?

Commander Todd. Yes; we are allowed to do that now, under the present act.

Mr. BYRNES. Putting those commercial stations out of business will have what effect, if any, upon the service on ships of the commercial companies that have stations upon ships, which you referred to a few moments ago?

Commander Todd. The effect would be smoothness of working, a quicker handling of their traffic on account of noninterference from a competing system. They would know that they were sending their message to a certain management, to a Government station, and the messages would be handled in a certain definite way, their accounts would come in a form they are used to, and there would be no question of who would be responsible for delays or errors.

Mr. BYRNES. To whom do they now send their messages?

Commander Todd. Partly to our Government stations and partly to commercial stations, depending upon where they are.

Mr. BYRNES. The same company is also interested in a coast station and the service upon the ship, is it not?

Commander Todd. Yes, sir; in some cases, and they work the two in combination.

Mr. BYRNES. Now, if you put their coastal station out of business, will it not mean they will be running at a much greater expense and make that service upon ships more expensive, or will it?

Commander Todd. No, sir; it would have no effect upon the expense of operating a ship, because the Government rates are at present the same as the commercial rates. We have not tried to compete in that way with them in these four years. We do compete in operating efficiency. We have maintained the same rates for uniformity's sake, and we make just as little distinction between a Government station and a commercial station as we can.

Mr. BYRNES. You do not think it would injure the service on the ships at all.

Commander Todd. No, sir; it would improve the service on the ships, because we always have all of our stations fully manned.

Mr. EDMONDS. There are a number of different systems of wireless—the Marconi and other different types of apparatus?

Commander Todd. Different types of apparatus; yes, sir.

Mr. EDMONDS. Do they intercommunicate with each other?

Commander Todd. Yes, sir; except as regards some of the later systems. Not all stations have been fitted to receive what are called "continuous waves." That is something that is being rapidly developed, and not all commercial stations and ships are fitted to receive these waves. But in all other respects any station can receive messages from any ship. All naval ships and stations receive continuous waves, and the principal ones are equipped to send, also.

Mr. KINCHELOE. You said a while ago, in answer to my question, that your prime reason for wanting a Government monopoly was for the national defense?

Commander Todd. Yes, sir.

Mr. KINCHELOE. I take it, of course, you mean to accomplish efficiency and secrecy at the same time if you have Government control.

Commander Todd. Yes, sir.

Mr. KINCHELOE. Have you a right now, under the law, in case of war to take over these commercial stations?

Commander Todd. Yes, sir; and what we would really do would be to shut most of them up. We have the Government stations already and we would not have time to work these others into our organization, except a few favorably situated or well equipped for our needs.

Mr. KINCHELOE. I understand that is the purpose in case you had Government monopoly; but I mean, under the law now have you the right in case of war, in this country, to go and take over these commercial stations?

Commander Todd. Yes, sir.

Mr. KINCHELOE. You have that power under the law now?

Commander Todd. We have. The point is this: When war is about to come down upon us it is too late to get any efficiency out of those commercial stations suddenly transferred to Government control.

Mr. KINCHELOE. I understand if war were to be declared, say, tomorrow, under the present law the Government would have the right to take over those commercial stations for the use of the Government?

Commander Todd. Yes, sir; in time of war or public peril.

Mr. EDMONDS. You did take possession of the station at Tuckerton?

Commander Todd. And at Sayville; those two commercial stations.

Mr. EDMONDS. You evidently had the right to do it or you would not have done it.

Commander Todd. Yes, sir.

Mr. HARDY. Do I understand you to say the Government did take over the station at Sayville?

Commander Todd. Yes, sir.

Mr. HARDY. Did it take them over or just put its own agents in to censor the messages? It did not take the stations over, did it?

Commander Todd. Not to the financial benefit of the Government; no sir. We put in our officers and operators. They are now operating those two stations.

Mr. HARDY. In other words, we are running them for the owners?

Commander Todd. Yes; that is it.

Mr. HARDY. So as to censor their performances?

Mr. EDMONDS. I think the former act provides in time of peril that they could be taken over, and as this was a time of peril we took them over.

Mr. HARDY. At any rate, if the Government has not that power, it ought to have it.

Commander Todd. Surely. But we can not take them over to advantage when war is imminent; it is too late. We have the principle that any measure of defense, any such arrangements not made beforehand and in working order when war is imminent, can not be made effective after war is declared, for a long time. It is too late to improvise; there are too many urgent things to do.

Mr. HARDY. Is it your idea that the existence of such means of communication within our country in time of war might be a source of danger to us?

Commander Todd. Undoubtedly a source of danger, sir. Any radio interference whatever would be intolerable. You see the troubles we have had in the questions of neutrality. We are having them now. We are not at war, but we don't know how near we are to it.

Mr. HARDY. If we had a privately owned wireless station of great power in the United States and another one either privately or governmentally owned in some country with which we were at war, that privately owned station might make any character of communication?

Commander Todd. Until we shut the station up or took it over, which we would do very promptly, as a matter of military necessity.

Mr. HARDY. You think in case of war we would have to close all privately owned wireless stations?

Commander Todd. Immediately; yes, sir; and possibly later develop the use of some of them in special circumstances.

Mr. HARDY. Either close them or take them over?

Commander Todd. Yes, sir.

Mr. BURKE. Permit me a question right there: I understood you to say a few moments ago that, in addition to taking over the coast stations, it was the intention under this bill, if it becomes a law, to take over the high-power stations that are now erected and in use in the country?

Commander Todd. Not as the bill reads, sir; but I am hoping the committee will take that under consideration.

Mr. BURKE. I understand. That provision or idea is not incorporated in the present bill, but you suggest that the committee, if it sees fit, incorporate that idea?

Commander Todd. Exactly, sir. In accordance with the strong recommendations of the heads of at least five executive departments.

Mr. BURKE. That would answer Brother Hardy's question: If this monopoly is established, there won't be any stations such as you suggested?

Mr. HARDY. I was just suggesting against any such stations being allowed to be established.

Mr. BURKE. If this bill becomes a law, with the additional idea, there won't exist any except Government stations.

The CHAIRMAN. Proceed.

Commander Todd. I will not take the time of the committee much longer. I should like to go very rapidly over the rest of the bill. Section 6 is another part of the mild Government-ownership suggestions in this bill; that is, any commercial company may sell to the Government, through the Navy Department, any coastal stations now in operation that the owner may desire to sell; that is, within five years they may offer those to the Government, but there is no compulsion there at all.

Mr. BURKE. If your idea is incorporated into this bill—of the Government taking all of these stations over—it will not be necessary to have that provision, will it, which is contained in section 6?

Commander Todd. No, sir. If the Secretary of the Navy's letter, Judge, could be read, it would be found to recommend that this section 6 be altered along certain lines. I think it is rather clearly set out in the Secretary's letter. Could that letter be read, sir?

The CHAIRMAN. It will be put in the record; yes.

Commander Todd. I hoped it might be read now.

Mr. BURKE. Does the Secretary in that letter suggest the time in which the Government shall or must take them over?

Commander Todd. Yes, sir; two years. Section 7 prevents the foreign ownership of stations in this country. We have had this unfortunate experience of the Sayville and Tuckerton stations, and this section 7 is intended to prevent a repetition of such a proceeding.

Mr. BURKE. Commander, for my information, and perhaps that of some of the members of the committee, the Sayville station is owned by Germany, is it not?

Commander Todd. It is owned by the Atlantic Communication Co., sir.

Mr. BURKE. Is that a foreign corporation?

Commander Todd. No, sir; it is an American corporation, but foreign owned.

Mr. BURKE. What rights did Germany have in and to that station, or is that station connected with some other station in Germany and used between Germany and this country?

Commander Todd. It is now working at very high pressure between Sayville and Berlin (Mauen).

Mr. EDMONDS. So far as I am concerned, if this bill goes through, permitting a foreign government to own a portion of the stock in those companies, I would not myself approve of having in the bill a provision that a foreign government could own one-third of the stock of a company. I do not think they have any right to do it.

The CHAIRMAN. Under our law the corporation would be an American citizen technically, and yet all of the stock of that corporation be owned by foreigners.

Mr. EDMONDS. But here is a section that gives a foreign government, the representative of the government, a right to own one-third of the stock.

The CHAIRMAN. So far as we are concerned, we have no law forbidding that; but in time of war I assume the Government would take over and control that station and, so far as that is concerned, the corresponding station in Germany and, indirectly if not directly, control the one here.

As I understand your statement, since the war in Europe, in order that we might protect ourselves as a neutral and not become involved in the controversy in Europe, the Government has found it necessary to take over the control of the Sayville station to all intents and purposes?

Commander Todd. Yes, sir.

The CHAIRMAN. And now the German Government for the same reason, it would seem to me, would take over the control of the corresponding station in Germany.

Commander Todd. Yes, sir; it is run directly by the German post office.

The CHAIRMAN. It would be a very violent assumption to say they did not do it. It is both in their interest to do it and a logical thing to do.

Mr. EDMONDS. I do not think we should allow a foreign government or representative of a foreign government to have one-third of the stock in any wireless company in this country. I do not think you do, either, do you?

Commander Todd. I do not know how to control it. The stock can be sold anywhere.

Mr. EDMONDS. We could not control it, but it would have a certain influence on the other stockholders when one block of stock or one-third of the stock was owned by one party?

Commander Todd. Yes, sir.

Mr. BYRNES. Suppose the individuals who control—the stockholders—were individuals the Government could control, they would get around it?

Mr. EDMONDS. You mean that if the individual members, say Frenchmen, controlled one-third of the stock?

Mr. BYRNES. You mean not to have individuals do it, much less the Government?

Mr. EDMONDS. As a Government, I do not think the Government should have control of any wireless station over here, or even a one-third interest in it.

Mr. BYRNES. They could do it through individuals, if not through the Government itself, if they wanted to. It would be hard to stop them.

Mr. EDMONDS. Possibly so; but at the same time it would not open up complications with the Government, if it happened to be taken over at any time, on account of having a one-third interest. Individuals you could handle, whereas a government would be a little different proposition.

Commander Todd. One paragraph in here, on page 8, section 7, prevents putting up a station where it will interfere seriously with existing stations, whether privately owned or Government owned.

Section 8 concerns the application for licenses and furnishes a penalty for making untrue statements in the application.

Section 9 gives the form and detail of contents of the license for a station.

Section 10 covers the revocation of a license by the Secretary of Commerce for failure to carry out the conditions named in the license, provides access to such books and records as will allow the Secretary of Commerce to judge of the ownership, and so on.

Section 11 provides for licenses for operators, with provisions to cover emergency cases.

The CHAIRMAN. I believe it provides that none but American citizens shall be operators, except in cases of emergency when others may be employed temporarily.

Commander Todd. That comes later on, sir. It is page 14, line 15, "Except for the operation of a station on shipboard, an operator's license shall not be granted to any alien, nor shall such a license be granted to a representative of a foreign government for the operation of any radio station."

From the Navy Department point of view, that "except for the operation of a station on shipboard," should be omitted. It is on account of the possibility of unneutral service.

Mr. BRUCKNER. Has nobody any means of telling what is being sent by an operator?

Commander Todd. Yes, sir; by themselves listening in with a receiver.

Mr. BRUCKNER. But the captain does not know, and has no way of knowing?

Commander TODD. No, sir; he must also be an operator to be able to understand the signals. If the captain were upon the bridge and had a telephone to his ear and a little receiver he would know what his own operator was doing. But the foreign operator could, having sympathies on account of his nationality, endanger the vessel and the people on board without the knowledge of the captain, and in that way possibly bring about international complications which would be embarrassing.

Mr. BURKE. Just one question. The provision commencing with the word "nor," line 17, page 14, and running to line 19, including the word "station"—is not that intended to prevent just such a condition as the Government found at the Sayville Station at the time it took it over?

Commander TODD. It could not be shown that the owners or the head men of that company were actually representatives of a foreign Government; but there was so much doubt about it that there was a question in the minds of the Department of Commerce whether or not that station should be licensed.

Mr. BURKE. It seems to me the newspapers stated it was taken over because it was being managed by representatives of the German Government, or citizens of the German Government.

Commander TODD. Practically so; but I can not say positively they were actually German citizens. There were Germans there, but the head men were naturalized American citizens, I am rather sure.

The operator's license, the form of it, and the penalty are contained in section 13.

Mr. HARDY. Did I understand you to say, on section 12, that those lines 15 and 16 ought to be eliminated so that there ought not to be any license—

Commander TODD. Yes, sir; that is the Navy Department's view of it. The committee did not take that view. Should the suggested change be made there should be incorporated in there a provision that in emergencies a ship might employ an alien operator. An American ship might be in a foreign port and the operator might die or desert. The law requires ships to have apparatus and the law requires them to have operators, and in emergencies a ship should be allowed temporarily to employ an alien operator; but no American ship should sail from a United States port without American operators.

Section 14 is intended to cover the neutrality of the United States in just such circumstances as we are in at present, and to cover an urgent necessity for preventing information of great military value going out in case this country should be on the eve of war or threatened with a war. Since commercial radio signals can be read by anybody having a receiver, ordinary commercial messages would contain information of vast importance to an enemy about to strike, especially in the case of a maritime nation, which would have its cruisers on the ocean. The movements of merchant vessels flying the American flag would then be of obvious interest to them. Time would be most precious, and a little delay in getting information or failure to get information would save many a ship. And the idea of

this section is to put in the hands of the President, as Commander in Chief of the Army and Navy, the power to prevent the prejudicing of our cause in the twilight period just preceding the war, especially in these days when wars break out with such surprising suddenness.

Page 16, paragraph (b), the President may cause the temporary closing of any radio station, or the temporary removal of apparatus, upon just compensation to the owners. In case we do not have Government ownership, that would permit the President to act in the way he has done in the case of the Sayville and Tuckerton stations. If he considered a station dangerous to the peace and good order of the United States, he might take it over and operate for five months at a time and compensate the owners for taking it away from them temporarily.

The CHAIRMAN. I do not imagine anybody would object to that—no American citizen.

Commander TODD. Section (c) makes stations liable to inspection at all times by the Department of Commerce.

Section 15 (a) has to do with malicious interferences. A good many of these sections are contained in former acts or based on the London convention.

(b) Is the secrecy part of the bill and the provisions of the present act has been amplified to allow an operator to furnish the accounting departments or administration of his company with copies of the radiograms. Also, there has been put in an item which strengthens the hold of the master of a ship upon his radio operators, and assists him in protecting the lives for which he is responsible—that is, an operator may show to the master of the ship any radiogram which he intercepts. This would be of especial value in case of conversations between ships containing items of interest in the navigation of the ship. The safety of the ship, passengers, and crew may be furthered by the radio operator coming on the bridge and saying that such and such a ship reported that such a lightship was adrift, or that such a buoy was out, or that there was a derelict in such and such latitude and longitude. Anything that could be drawn down out of the air that would further the safety of a ship and passengers and crew should be made available to the responsible officer. This would also prevent the radio operator from being too independent of the master and too high handed. I have been told that this has occurred in one or two instances.

Mr. BENEDICT. Do all operators use the same code, so that any ship or any nation could read the messages of other ships and other nations?

Commander TODD. Yes, sir; all use the International Morse Code.

Mr. BENEDICT. Is it not possible, in time of war, for one nation to use an entirely different code so that other nations could not read their messages?

Commander TODD. It would be possible, but not practicable or necessary.

Mr. BENEDICT. Would it be hard to install such a system?

Commander TODD. Yes, sir; you would have to train the operators very carefully. We use cipher. We use our regular code book, and in time of war would still further blind the meanings of our signals by cipher. We habitually, in our Government communications, put

what we have to say in code for training the operators to receive it and for training the officers to decipher those messages. Operators get into the habit of receiving words they are more or less familiar with carelessly. They guess at words or fill in the blanks if they miss letters. Receiving a succession of letters and numbers which mean nothing to them requires closer attention and greater accuracy, and fits them for what they would be required to do in time of war. Nothing could be sent in plain language in time of war.

Section 16 gives priority to distress calls, which is part of the present act and the convention.

The second paragraph of section 16 is a requirement of the London convention.

Section 17 concerns safety at sea, except that the second paragraph of 17 has to do with the character of the apparatus, which increases the possibilities of communication in any given area. It is to prevent the worst types of apparatus being used. It is not very restrictive. The technical men present will explain that to the committee at length, if they so desire.

Receiving apparatus is covered in the next paragraph. This is also a very mildly worded measure.

Now we come to the sections that deal with the different classes of stations. Section 18 leaves amateurs just where they now are. The first paragraph is the ordinary boy who puts up a station and gets a license. There is no license required for receiving. The second paragraph keeps boys too close to the Government stations from using too high power. They are restricted a little more than the others, if they happen to be within five miles.

The third paragraph makes provision for a few very special stations that may be of use to the Government at one time or another, or from which the art of radiotelegraphy or other interests may get some use. The Government may, in some way, get some use out of those special amateur stations in cases of floods, etc., and possibly as receiving stations in case of war.

The CHAIRMAN. Did you say there are no further restrictions placed on amateurs in this bill than in the present law?

Commander Todd. No further restrictions. Those restrictions are found to cover the case satisfactorily.

Mr. Rowe. You said it holds them to a lower power, didn't you?

Commander Todd. That was in the other bill; that is not a new restriction. The intention of the committee was to impose no additional restrictions.

Section 19 has to do with the development of the art. That is, the Secretary of Commerce has power to permit tests of any kind, with certain moderate restrictions. The aim has been all through this bill to encourage the development of apparatus. The Government constantly requires apparatus of increased efficiency, and will buy as fast as it is developed. Ships are also improving their apparatus from time to time—commercial ships.

Section 20 has to do with commercial stations; that is, stations that do not communicate with ships, but operate between fixed points where land lines or cables are not practicable, and in other cases compete with land lines and cables. It also covers technical and training school stations, and keeps them from interfering with those wave lengths ordinarily used by the Government as well as

those ordinarily used for commercial purposes between ship and shore.

The CHAIRMAN. Does this wave length limit the distance messages can be sent?

Commander Todd. No, sir; there is no limit on the longer wave lengths. The longer wave lengths are more favorable to distant communication, especially over land. It simply keeps them away from the most important wave lengths, those most useful for communicating between ship and shore. The commercial wave lengths used between ship and shore are laid down in the London convention, and naval messages are sent ordinarily by ships on a wave length within the range reserved by all Governments for Government ship-to-shore work.

The CHAIRMAN. That is, the wave lengths between 600 and 1,600 are reserved for the Government.

Commander Todd. Yes, sir; all Governments reserved that range in the London Convention.

Mr. HARDY. I see you also have a special wave length of 1,800.

Commander Todd. That is also in the London convention.

Mr. HARDY. Why was that special wave length provided?

Commander Todd. Some nations demanded it, because it was found that the Dutch, for instance, were sending messages from their ships in the Mediterranean clear across Europe to a station at Scheveningen, near The Hague; and in the discussion it seemed that there was some need for allowing ships to communicate with a more distant station in its own country rather than to follow the rule of communicating with the nearest shore station. The international arrangement is such that a ship is required to communicate with the nearest station, so that she will not need to use high power for the purpose, and further transmission is arranged for by requiring international telegraphing and cabling arrangements; but this special provision allows a ship to pass over the head of a nearer station when it can be done without interference, to provide communication between ships of a certain nationality and stations belonging to the same nation.

Mr. HARDY. So that private ships may use any wave length over 1,600, except that one of 1,800?

Commander Todd. Yes, sir; they may use that also, but they must use it in strict compliance with the London convention.

Mr. EDMONDS. This is taken from the London convention?

Commander Todd. Yes, sir; directly. The paragraph concerning complaints of interference favors the ship-to-shore work and favors communication between fixed points where land lines and cables do not cover.

Section 21 is from the London convention and deals with the ordinary communication between ship and shore, with an added paragraph for distress purposes, requiring the receiver to be so marked that the operator can quickly turn to 600 meters for receiving distress calls. The receiver must be so marked that the shift from a certain wave length to 600 meters can be very prompt.

Section 22 is a provision of the present act just reprinted.

The second paragraph of 22 is new. It can be shown that a very great amount of interference is caused by ships using their transmitters when they are in harbor. Such use is a very great con-

venience and in an emergency, of course, is very necessary and should be allowed; but ordinarily the ship at sea is the one that should be favored; the ship at sea is the one that should be able to report the time of arrival and ask instructions as to when and where to dock, and so on. The ship in port should put her message in a boat, send it ashore, and from there send it by telephone or telegraph. That regulation need not be applied in all harbors; only where necessary.

Section 23 protects certain very important Government stations from other stations being erected too close to them. It seems that for many years the possibilities of noninterference on account of difference of wave lengths have been extended; that is, the number of communications that may occur in a given area with different wave lengths has increased. But it still remains true that in spite of difference in wave lengths a station sending with power will affect the receiver of another nearby station in spite of a great difference of wave length; that is, in this city, for instance, if a high-power station were put up, Arlington could not receive anything on long waves. It all depends upon the power used and upon nearness, upon efficiency of apparatus, heights of towers, spread of antenna wire, and, of course, the more nearly alike the receiving and sending wave lengths are the more interference. This provision taken from the act now in force protects the important Government stations of the Army and Navy to a slight extent; that is, it keeps commercial stations at least 15 miles away, which is considered enough in these days, as they go to great lengths to choose a site for a radio station, anyway.

Section 24 has to do with the division of time. It is really very unfortunate that we have to ask for a thing so restrictive, but it is a provision that was incorporated in the present act, and should remain in the bill as it stands. In the present act a Government station is allowed 15 minutes out of every hour—the first 15 minutes. That was the utmost we could get the committee and Congress to give us. As a matter of fact, we have not requested an enforcement of that at any place in these four years. Where the pressure was too great we have arranged to do most of the Government business in some other way. We have had to restrict the value of our stations to the Government in one or two places.

In other places we have met with the very cordial cooperation of the commercial stations and have been able to arrange sending schedules, so that when one is receiving the other will not be sending. Those arrangements are sometimes very satisfactory, but unless Government ownership is accomplished the time will come when one station will insist on saying that it has as much right to work as another station. Where interference is greatest there are ordinarily three interests involved, the Navy and two others. We have a situation like that in New Orleans, another one on the west coast, in San Francisco, and are soon to have one in Hawaii. Their interests are involved; but without some special arrangements the stations can not work satisfactorily. All three, or more, stations could send together and all could receive together on different wave lengths. This would make them come to terms with us. If they insisted on working or combined to divide up all the time between themselves the Government stations could fall back on this and require them to give the Government communications half the time and relieve Government

stations of the necessity of "fighting for the air." There is no dignity in that.

It will be announced or stated that the Government communications are of small importance, as compared with the commercial business going through the stations. That is sometimes the case and sometimes it is not the case. In the case of communication with the Canal Zone—between here and the Canal Zone—and some of the communications of the New Orleans station, in view of the Mexican trouble, I would say that the Government messages are of many times more importance than the average urgent commercial message. Other cases reverse the situation, and the commercial messages are of more importance, and in those cases we fall back on the land wire for all except very necessary communications at sea with our own ships when we are not prepared to work overland with specially high-grade apparatus without interfering.

Section 25 has to do with sending out false radiograms and fixes a penalty.

Section 26 legalizes an arrangement that is now in force. Under the act passed in 1912, the Navy Department opened certain of their stations and with the ratification of the Berlin and London conventions the country was obligated to handle international accounts. That is, whenever a ship flying a foreign flag, a merchant ship, communicates with any shore station in the United States, the Government is required to look out for the accounting for that communication, and it looks to the Government owning the ship for the tolls collected from the sender of the message. In the same way, if a United States ship uses any foreign station, it immediately becomes the subject of accounts between the Government concerned and this Government. Somebody had to handle them, and as the Navy Department was the one handling commercial business, we have been looking out for these international accounts ever since. This gives the authority of Congress for that arrangement.

Section 28 provides the general penalties.

Section 29 provides for the enforcement by the Department of Commerce, with the paragraph permitting the Secretary to remit any fine, penalty, or other forfeiture, other than the penalty of imprisonment.

Mr. EDMONDS. Let me ask you a little something that occurs to me right here. The Secretary of Commerce seems to be carrying out this bill in all the penalty provisions and all matters of general supervision. Now, these wireless stations, if you take them over, would be under whose control?

Commander Todd. The Navy Department.

Mr. EDMONDS. Altogether?

Commander Todd. Yes, sir.

Mr. EDMONDS. Has the Army got any?

Commander Todd. Yes, sir.

Mr. EDMONDS. The Army has got some?

Commander Todd. Yes, sir; but the Army does not handle commercial work except in Alaska and at Corregidor near Manila, if I remember rightly.

Mr. EDMONDS. Does this turn the Army stations over to the Navy?

Commander Todd. No, sir; not at all. Only privately owned coastal stations.

Mr. EDMONDS. I know; but you are not in this bill arranging for any department to have charge, and it is going to be a mixed affair after you do take over these stations; the Secretary of Commerce has something to do with it, the Secretary of War has something to do with it, and the Secretary of the Navy has something to do with it.

Commander Todd. Yes, sir; but we are working now under a practical arrangement. The bill simply extends the activities of the Navy Department and to some extent the activities of the Department of Commerce. At the same time, the Department of Commerce would be relieved of the necessity of licensing the coastal stations taken over by the Navy Department.

Mr. EDMONDS. It does not say "shall" in this bill at all; it simply says the Government may take over or buy any stations the Government desires.

Commander Todd. In section 6 it says, "The Government, through the Navy Department, shall have authority to acquire by purchase." This has been agreed to by all departments.

Mr. EDMONDS. Yes; through the Department; that is right.

Commander Todd. That matter was adjusted many years ago, and all the departments have stuck to the arrangement then provided for and approved by the President, the gist of it being that radio telegraphy is of the greatest use to the Government of the United States through the Navy Department, on account of its strong need for control of the fleet and communications with it.

Mr. EDMONDS. When we open those to commercial business and can collect money for the different stations, it will be turned into the Government through the Navy Department?

Commander Todd. The Navy Department would collect the money and turn it into the Treasury, as we are doing now, sir. The bill increases the number of stations which will do the work we have been doing for four years.

Mr. EDMONDS. Is it the idea that the present stations belonging to the Army should be turned over to the Navy?

Commander Todd. No, sir. The Army stations, except in Alaska, are used for intercommunication in the artillery districts and for fire control purposes. They have not handled any commercial work except in Alaska and the Philippines, nor have they gone in for high-power stations. That has been our policy, which they have not adopted. Generally speaking they need only their stations in fortifications, their communications with mine-laying ships, and to some extent with their transports; between their stations on the Mexican border and field sets; and between two interior stations, one at Omaha and one at Fort Leavenworth. Except for coast defenses, work with portable sets in the field is of greatest importance to them.

Mr. EDMONDS. Let us assume you have a Secretary of Commerce who would not be friendly with the Secretary of the Navy, and the Secretary of Commerce commenced to hamper messages with commercial stations. Who would handle that?

Commander Todd. This bill does not give any power to hamper naval stations. The Department of Commerce could cause a large amount of correspondence and some confusion possibly; but fortunately there is no unfriendliness, nor is there ever any sign of that. We work in perfect harmony and cooperate very successfully. They carry out their bill. That is, the act now in force. There would not

be any new departure if this bill were passed. We keep them informed of our extensions and activities and handle their radiograms the same as we do those of the other departments of the Government.

Mr. EDMONDS. There will be a great many new questions arise when you are doing all the commercial business.

Commander Todd. No, sir; no more than now.

Mr. EDMONDS. And the Department of Commerce might not agree with the Navy Department in carrying out all of that business.

Commander Todd. The Department of Commerce agrees, and you will find that several of the departments indorse not only this bill but the extension of it—to complete Government ownership in the hands of the Navy Department. The Post Office Department maintains that there is no essential difference between radio communication and land-wire communication and that the Post Office should handle all kinds of communications.

Mr. EDMONDS. I agree with you that the present Secretary of the Post Office Department will agree to any Government-ownership proposition that would come under it.

Commander Todd. They concur in this, but believe that the Post Office Department should handle it.

Mr. EDMONDS. Oh, yes.

The CHAIRMAN. Every Postmaster General for years past, I think, beginning with Wanamaker and possibly further back than that, has recommended that the Government take over the telegraph system as a part of the postal system; and the present Postmaster General, following out the same analogy, also says the Government should take over the wireless, too.

Mr. EDMONDS. Don't you think it ought to print "Post Office Department" in here, too, somewhere, so that there would be three to work at it—so that two could have a majority at any time?

The CHAIRMAN. We take conditions as they arise and solve them. So far this bill is drawn along lines of the existing line of work, which are working with perfect harmony.

Mr. EDMONDS. I was rather curious, because it seems to leave the decisions to the Secretary of Commerce in the regulatory provisions, whether there would be any harmony when they got to work on this immense volume of commercial work.

Commander Todd. You will notice that the Secretary of Commerce alone regulates the commercial stations, privately owned concerns of all kinds, amateurs—everything except the Government stations. The Navy Department has no control whatever over privately owned stations, but would have all to do with the handling of the increased commercial work of its own stations. We do not expect a vast increase for some years.

Mr. EDMONDS. And the departments of the Government that actually own and operate apparatus operate the stations and ships in conformity with the London convention and their own regulations?

Mr. HARDY. Does not section 29 put the whole enforcement of this act in the Secretary of Commerce, notwithstanding other departments have a good deal to do with its enforcement?

Commander Todd. Notice the exception in the last three lines:

\* \* \* except that provisions thereof relating to Government radio installations shall be enforced by the departments respectively controlling such installations.

That is the present arrangement; that is what we have been doing since we built the stations many years ago.

Mr. HARDY. Oh, yes; I did not observe that.

Commander Todd. Section 30 says how far the act shall extend and section 31 definitely repeals the act now in force.

May I say a few words more, sir?

The CHAIRMAN. It is now 1 o'clock. If you can conclude in 5 or 10 minutes, proceed; or, if you prefer, you may conclude to-morrow morning.

Commander Todd. I should prefer to sum up and state, in the strongest words I can find, the necessity for complete Government ownership to-morrow, if I may have the time.

(The committee thereupon adjourned to to-morrow, Friday, January 12, 1917, at 10 o'clock a. m.)

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HOUSE OF REPRESENTATIVES,  
COMMITTEE ON THE MERCHANT MARINE AND FISHERIES,  
*Washington, D. C., January 12, 1917.*

The committee met at 10 o'clock a. m., Hon. Joshua W. Alexander (chairman) presiding.

**STATEMENT OF COMMANDER D. W. TODD, UNITED STATES NAVY—**  
Continued.

The CHAIRMAN. Commander, you may proceed.

Commander Todd. I won't take the time of the committee much longer. With what I said yesterday, and the questions of the committee, I have brought out most of the points. I will, with your permission, emphasize a few points that were brought out yesterday and will then speak briefly on the subject of neutrality and the main purpose of the bill.

I want to emphasize the point that, referring only to the section which opens Government stations to commercial business, what we are doing is taking from the commercial companies in time, through efficiency of operation, the shore end of the commercial business only. The ability of ships to communicate with shore is facilitated rather than interfered with, and our management of it would tend to smoothness of working and the elimination of interference, which is steadily growing, something I will touch on a little later. It does not mean that the Navy would ask for additional money with which to put up stations to handle this business. The stations are there and have been for some years, some of them ever since 1906, and they are handling Government business only. They are fully manned, ready. It would not be a new business for us, because we are handling considerable commercial business now. There are 51 stations altogether, 23 of which are handling commercial business. Of those not handling commercial business, some of them—notably Arlington and Darien—will remain as they are, because they are reserved for Government purposes only. They are so useful to the Government for its own messages that they could not be spared for commercial business and so be of more use to commerce than they now are. There are a sufficient number of others that have been

guarding our coasts these many years. It is simply an extension of our present activities, for which we are ready with a very slightly increased office force. Maybe we will have to ask for a clerk or two. We will go ahead and take up this additional commercial work, but we do not expect for some years to have more than double the amount of work we are now doing, and we can easily handle it; we have the organization and are ready.

This bill, I believe, will be opposed. I do not fear that it will be opposed; I believe it will, because past history indicates it. Every radio bill that has been brought before this committee of Congress has been opposed. The ratification of the Berlin convention was strongly opposed. I can not answer for the London convention, as I was not here. The opposition will be able to show the committee, without any doubt about it, that they do not wish to sell their stations or give up their business; they do not wish the Government to extend its activities. They bitterly opposed the feature of the last bill by which Congress allowed us to take up this commercial business in out-of-the-way places and at frontier stations.

They will show the committee, and prove it, too, even by the Government's own experts, by their writings and possibly by their testimony before this committee, that this question of interference—there is nothing to it; it can be avoided by such and such measures and such and such apparatus which they have or expect to have soon, but they will only befog the issue by talking of decrements and wave lengths and selectivity. In this case we are after every-day practical working conditions, and we have some one who will be able to inform the committee at first hand, to give the committee first-hand information on that subject, an expert of the highest order. He does not get his information from written reports from electricians in charge of stations, who are anxious to show how efficient their stations are; or through log books of ships to show what the operators regard as interference; or from general reports; but from his own personal observation on many parts of this coast. His testimony on the matter of interference is of such importance to us that I will say no more on the subject.

The CHAIRMAN. To whom do you refer?

Commander TODD. Lieut. Commander Hooper, sir.

Mr. GREENE. Is he coming before the committee?

Commander TODD. I have him here now, sir.

I would now like to mention the subject of neutrality. There has been a great deal in the newspapers about the difficulty of maintaining the neutrality of the United States when radio stations can and do send out messages which are of military value to one or the other of the belligerents. The movements of a merchant ship are of very great importance to the warships of the enemy. If messages are picked up, as all those messages can be picked up, showing that a certain merchant ship has sailed or expects to sail from a certain port, even that information is of value although her destination be not definitely known; because that can easily be guessed at from the nature of the ship and the port from which she sails. But that is only a very small example of the unneutral service that may be performed. Of high-power stations, Sayville and Tuckerton, we can not say much in open session. We have had to make the very strictest rules for those stations; special rules, so that there would be no

possibility of the British Government or the French Government complaining of the unneutralty of those stations. To avoid any possibility of unneutral service we have required everything except German embassy messages to be in plain language. But even that requirement does not fully eliminate the possibility of unneutral service. To go back a little, the President assigned to the Navy the duty of maintaining neutrality so far as the work of radio stations was concerned.

It has been enforced with the greatest difficulty and in spite of the cooperation of the commercial companies. The commercial companies owning shore stations have earnestly tried to assist us in every way, but the inherent difficulties are such that to make it effective we have had to make general regulations governing all stations. That works a hardship in some cases. The department is bound to do everything possible to make it effective by consistent regulations.

We all know how many suggestions there have been of our getting into this war. There have been several cases where we have had information sent out by radio that might lead us into trouble. When the submarine raider, the *U-53*, suddenly appeared on our coast and commenced sinking ships several communications went out indicating that such and such a ship had been sunk at such and such a place and by a German submarine. There was one case in particular, and lately I have heard of several others. Those messages might have two effects. One would be to warn merchant ships of the allies to get into port as soon as possible or to change their destination and make a break for the 3-mile limit to avoid this submarine. The other effect would be to inform British cruisers that have been hovering near our coasts from time to time since the war started that this submarine was in this part of the ocean and in a very well-defined area off Nantucket Shoals. In both cases we are aiding the allies in letting such messages get out. The question of distress calls came up. If an American ship or one of our stations picks up a distress call and broadcasts it, which is the usual procedure in case of distress, the broadcasting of messages saying that a German submarine has sunk such and such a vessel in a certain longitude and latitude might have the effect I have mentioned of warning vessels to seek neutral waters and bringing the allied warships to the spot; or, if they report such and such a vessel sinking in such and such a latitude and longitude and say nothing about a German submarine, it might cause other allied vessels to come to the aid of passengers and crew of the sinking vessel.

Mr. GREENE. Is there anything wrong in that?

Commander Todd. The German submarine might be in the neighborhood and other ships might be sunk.

Mr. EDMONDS. Assuming the Government had been running the wireless at that time, would not the Government have done exactly the same thing?

Commander Todd. No, sir; all such Government messages are presumably sent in code, and the instructions cover that.

Mr. EDMONDS. But would not the Government have given the newspapers the information that such sinking occurred and thereby have given the Germans notice?

Commander Todd. Yes, sir; to the newspapers, but that is not sending it out over the ocean, sending it broadcast.

Mr. GREENE. Do you object when a vessel has already been sunk or is probably sinking, to any provision being made to take care of the people aboard the vessel?

Commander TODD. There is provision made. Coast guard vessels and the nearest naval vessels take such action as may be ordered, but we say nothing about it broadcast by radio.

Mr. EDMONDS. Do you mean to tell me you would allow other ships, by sending out a rescue call, to go into that radius and be sunk, too?

Commander TODD. If the sinking ship sends out a distress call we can not repeat it without the possibility of assisting one belligerent or another. We may not warn other ships.

Mr. EDMONDS. Also the Government might go to work, by notifying the ships of other nations when sailing from ports, by wireless, and thereby give the Germans notice these ships were coming out of port, thus affording them a chance to get at them, too.

Commander TODD. That is what I am trying to bring out—that the whole question is so complicated that it deserves the serious attention of the committee. That is along the lines of a statement I made, that we have kept our radio neutrality with more or less success, with the greatest difficulty, in spite of the cooperation of privately owned radio stations. Stations under direct Government control are necessary.

Mr. EDMONDS. The two radio stations, at Tuckerton and Sayville, I understand they exchanged messages by cipher which were taken for commercial business concerns; had you been running them as Government stations at that time, you could not have refused a commercial message from a reliable concern in code, and doing the same work exactly that was being done by those two stations when you took possession; and would not the sending of such messages be considered far more unneutral if the Government were running those stations than if a private concern?

Commander TODD. Unless the Government would not transmit any message which could be picked up by an enemy and be of value to them.

Mr. EDMONDS. How could you tell?

Commander TODD. It would be in code and we would require a translation.

Mr. EDMONDS. Suppose they had a cipher to the code; we don't know.

Commander TODD. No, sir.

Mr. EDMONDS. You could not?

Commander TODD. We could not tell.

Mr. EDMONDS. Let us assume that had there been a Government station there, and I had come there with a code message or a cipher message to be sent out; you would have to send it?

Commander TODD. We would have done one of two things, depending on what our instructions were; we would have shown you our instructions saying that no cipher or code message would be allowed to be transmitted to a German station; or that we could send the message provided you gave us a translation of it and satisfied us that it was a bona fide translation. In any event, no information of value to belligerent military or naval operations would be sent.

Mr. EDMONDS. Are you doing that now in your commercial stations?

Commander TODD. We are requiring plain language in radio-grams addressed to belligerent stations or ships, and forbidding the sending of the information mentioned above.

Mr. EDMONDS. In all your commercial stations?

Commander Todd. In all radio stations of the United States. I have here a copy of our neutrality regulations which I wish to have made part of the record.

INSTRUCTIONS RELATING TO ENFORCEMENT OF PRESIDENT'S EXECUTIVE ORDER  
REGARDING RADIO COMMUNICATION.

[Modified Apr. 21, 1915, and Mar. 3, 1916.]

NAVY DEPARTMENT,  
*Washington, January 1, 1915.*

The following instructions supersede all previous instructions and will be in effect from the date of their receipt:

1. Radio messages containing information relating to the location or movements of armed forces of any belligerent nation, or relating to material or personnel of any belligerent nation, will be considered as unneutral in character and will not be handled by radio stations under the jurisdiction of the United States, except in the case of cipher messages to or from United States officials.

2. No cipher or code messages are permitted to be transmitted to radio ship stations of belligerent nations by any radio shore station situated in the United States or its possessions or in territory under the jurisdiction of the United States. Similar messages received by such radio stations from ships of belligerent nations will not be forwarded or delivered to addresses.

3. No communication of any character will be permitted between any shore station under the jurisdiction of the United States and warships of belligerent nations, except calls of distress, messages which relate to the weather, dangers of navigation or similar hydrographic messages relating to safety at sea.

4. No cipher or code radio message will be permitted to be sent from or received at any radio station in the United States via any foreign radio station of a belligerent nation, except from or at certain stations directly authorized by the Government to handle such messages. Press items in plain language relating to the war, with the authority cited in each item, will be permitted between such stations, provided no reference is made to movements or location of war or other vessels of belligerents. The restriction as to the movements or location of war or other vessels of belligerents shall not apply to press items received from belligerent shore radio stations.

5. No radiogram will be permitted to be transmitted from any shore radio station situated in the United States or under its jurisdiction to any ship of a belligerent nation or any shore radio station that in any manner indicates the position or probable movements of ships of any belligerent nation.

6. Code or cipher messages are permitted between shore radio stations entirely under the jurisdiction of the United States and between United States shore stations and United States or neutral merchant vessels or neutral shore stations, provided they are not destined to a belligerent subject and contain no information of any unneutral character, such as the location or movements of ships of any belligerent nations. In such messages no code or cipher addresses will be allowed except those registered prior to July 1, 1914, and certified copies of which are filed at the United States radio station through which the message is to be transmitted. All messages must be signed either with the sender's name or with a duly certified registered name complying with the requirements for registration of address. Radio operating companies handling such messages must assure the Government censor as to the neutral character of such messages. Such messages, both transmitted and received, must be submitted to the censor at such time as he may designate, which will be such that will not delay their transmission.

7. In general censoring officials will assure themselves beyond doubt that no message of any unneutral character is allowed to be handled.

8. In order to insure that censors may, in all cases, be informed thoroughly and correctly as to the contents of radio messages coming under their censor-

ship, they will demand, when necessary, that such messages be presented for their ruling in a language that is understandable to them.

9. At such radio stations where the censor is not actually present at the station when messages are received by the radio station for forwarding either by radio or other means, messages may pass provided they are unmistakably of a neutral character, without being first referred to the censor, but the operating company will be held responsible for the compliance by their operators with these instructions.

Approved:

JOSEPHUS DANIELS,  
*Secretary of the Navy.*

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Mr. EDMONDS. When did you start; after you found out it was being done in those private stations? You did not start when the war started, but the instructions were issued when you found out that such a thing was possible in those private stations?

Commander TODD. I won't say that. I am not familiar with the early instructions, but I doubt it. The neutral regulations were gotten up by the State, War, and Navy Departments, jointly, I understand; how early in the war I can not say, because I was not here. I can obtain the information, however.

Mr. EDMONDS. It is your opinion that neutrality would be better preserved if the Government owned those plants?

Commander TODD. It is the only effective way of preserving effective neutrality.

Mr. EDMONDS. Would that be a better way to prevent a breach of neutrality than if a private concern owned the plants?

Commander TODD. I believe it would absolutely prevent a breach.

Mr. EDMONDS. You do not think it would precipitate a more serious question than if they were in private ownership?

Commander TODD. It could not precipitate a more serious question. We are in duty bound to prevent anything which is not covered by existing international law going on on our shores that assists one side or the other. As I said, this question of the Sayville and Tuckerton stations has been so much in the public press, and there has been so many claims that unneutral messages had been sent, that we have had to make the regulations very strict, and when the Marconi Co. wished to take up commercial business with Japan we found ourselves in the position of imposing on them the same conditions that applied to Sayville and Tuckerton, although the Pacific Ocean is clear of belligerent operations, and there is cable communication with Japan. We had, for consistency, to treat one nation the same as the other. Japan being one of the allied nations, messages destined for that country were treated and are treated exactly the same as those for Germany, with a slight modification in regard to code addresses in use prior to beginning of the war, at the earnest request of the Marconi Co. There are many things to-day which could be done on the Pacific Ocean on account of there being no German ships on that ocean at present, and the elimination of German interests as far as the Caroline Islands; but for consistency's sake those burdensome regulations—they must be more or less burdensome—on commercial business are enforced in that part of the world.

Mr. GREENE. Are you censoring the cable messages?

Commander TODD. No, sir; we have nothing to do with them. They are perfectly free. They are censored at the other end, and we do not censor them here. Recently Sayville and Tuckerton—

Mr. GREENE. I do not see why that would not be as dangerous as the wireless message.

Commander TODD. It is not so dangerous in this way, sir; the information passes under the sea and no one gets it because no one can pick it up between this end of the cable and the censor at the other end—there is a British censor at the other end of the cable—but a radio message can be picked up by any vessel at sea—any war vessel, any merchant vessel, or anybody who has a proper receiver. It is open to all. It is like my making openly here any one statement, which every person in the room gets if he chooses to listen. That is where the difference comes in; that is why it is necessary to censor radio stations. We do not censor receiving. The reception of messages and their transmission through the country by newspapers, telegraph, etc., is unrestricted; but the sending broadcast to ships at sea information that is of value to warlike operations is unneutral service, has always been so considered, and we have put forth our best efforts to guard our neutrality as well in this matter as in any and all other matters, with difficulties just as serious as you have seen in other cases.

Mr. EDMONDS. Do you censor all of the high-power plants now?

Commander TODD. Yes, sir; we have censors for all of the high-power plants that communicate with the nations at war. We do not censor any communications to another neutral country or with our own ships—ships of the United States. Communications with the nations at war are the ones which are censored. There is an officer detailed for that purpose at every such station, and he passes upon every message. If the officer has the slightest doubt, he telegraphs the message to the Navy Department for instructions.

Mr. EDMONDS. You have men, then, located at every high-power plant?

Commander TODD. Yes; those that communicate with any of the countries at war, which means only the Sayville and Tuckerton Stations and the Kahuku Station of the Marconi Co. on the island of Oahu.

There is more to be said upon the question of neutrality, as I said before, but I can not tell the whole story here. I hope that I have said enough to indicate that the strictest of Government control is necessary in these very sensitive times when we may be drawn into this European war. The only way to guard our neutrality properly is by permitting only those stations to operate which have officers and operators used to the strictest military control.

Just a few words, sir, and I will close. The opposition to the bill will bring up many points. They are going—

The CHAIRMAN. You understand the proponents of the bill will have the opportunity to close the hearing.

Commander TODD. Yes, sir.

The CHAIRMAN. And to answer any objections that may be made. That would be the logical order, I should think.

Commander TODD. I would like to say that there will be many points brought up, and the Naval Radio Service—they will probably points out some faults in it, and maybe some uncorrected faults.

I wish the committee would keep in mind the military necessity for this matter. Before the bill was born, months ago, it was opposed in a printed document. It accused the Government executive departments of furthering such a bill under the guise of preparedness. I want the committee to know this is not a guise at all; this is a real necessity. We read in the newspapers every day of such and such a delicate subject being handled. The papers are full of what the President is going to do next, and how every word is treated abroad; and so many people in this country have taken sides in this war, in one way or the other, that constantly in the newspapers comes out the hint that we may be drawn into this world-wide war, as they call it. Just the other day there was a little squib in the paper which quoted Secretary Lansing, if I recall it correctly, as saying that the United States has made this move toward peace for fear the United States, if the war should continue much longer, would be drawn into it. All those things point to preparedness, and this is a real question of preparedness. These stations operated by commercial companies and taken over by the Government after a war starts—that means nothing. The war having actually begun, the stations would be closed and a seal put on the doors, so they could not do any sending, and that would be all there would be to it. It would be too late. The mischief would have been done before the war commenced—in those few precious hours immediately preceding the outbreak of hostilities. We have seen with what suddenness modern wars have started. The Japanese attacked the Russians overnight; no warning at all. The astounding suddenness of the outbreak of the present tremendous conflict was a startling thing to the world; events followed one another so fast. We can not afford to have any thought of preparedness along these lines that does not mean instant readiness, and we can not be ready for instant control of this fleet, nor can we be instantly ready to prevent our stations giving out information of value to the enemy unless we are in control at the first blush of hostilities.

I feel more strongly on this subject than I can express. There are others who will speak much more strongly and I am going to stop my part of it here.

The CHAIRMAN. As I understand your view, we are spending hundreds of millions, even billions of dollars, for national defense and especially to build up and strengthen our Navy, and one of the essential elements to make that defense effective is control of these stations?

Commander Todd. Yes, sir. What we would have to do in time of war—

The CHAIRMAN. And yet it is of course natural that private interests always kick when the Government comes in contact with them and the public interest is not in harmony with their interest. Just like other people, they are selfish; they think the public interest should be subordinated to their interest and we should not interfere with their commercial transactions; but I think they are patriotic, and, in the event of war, would behave nicely.

Commander Todd. I hope it will be plain to the committee that the national interests are paramount and, in this case, private commercial interests should be protected as far as possible by buying

them out at this time when it can be done with comparative ease. I mean with a comparatively small expenditure of public funds. This measure is advocated by all of the departments of the Government, and in some cases in such strong language that I wish the committee would have these indorsements by the executive departments read. The question is presented in such clear language in the two or three I have been allowed to see that appending them to this hearing in a printed document I am afraid will not suffice; I am afraid the members of the committee, having many important matters to handle, will not find time to go into those printed pages, especially as these appendices are written in a smaller type than the rest. I refer particularly to the letters of the Secretaries of the Departments of Commerce, Labor, Treasury, and Navy.

The CHAIRMAN. At the proper time of course, I will cause all the communications of the departments to be read, when we can have the full committee meeting.

Commander Todd. Yes, sir.

The CHAIRMAN. It won't take long and it will give the committee the viewpoint of the departments.

Commander Todd. One thing more on the matter of military necessity. The little island of Oahu, the principal island of the Hawaiian group, with the city of Honolulu on it, also the naval station at Pearl Harbor, has three high-power stations; and so important is that little island of the Hawaiian group to the Government, in the eyes of the Navy, that I can not get anybody in the Navy Department to listen to me with patience on the subject—the situation appears to us impossible, dangerous, and requiring immediate action, however strong.

I thank you, sir.

#### STATEMENT OF HON. THOMAS EWING, UNITED STATES COMMISSIONER OF PATENTS.

Mr. EWING. Mr. Chairman and gentlemen, I was appointed by Mr. Secretary Lane to represent the Interior Department on the commission, and I have attended the various sessions and hearings, and wish to say that the Secretary is strongly in favor of this bill, as I am, and has strongly expressed himself in writing to the committee. But I know that his statement did not go beyond this bill; it did not give his acquiescence in the proposal of complete Government ownership. Personally, I am not in favor of that. The department, however, has little or nothing to do with the question, and therefore I shall not give my reasons for not favoring Government ownership unless the committee requests me so to do. I therefore, for the moment, appear merely to say, at Commander Todd's request, that I, together as I understand with all the members of the committee, am in entire accordance with the principles of this bill.

The CHAIRMAN. Are you in favor of the bill as it is written and proposed here?

Mr. EWING. Yes; the bill as it is here presented.

Mr. EDMONDS. Section 6, Mr. Commissioner, gives the Government the privilege of taking over all plants at their option.

Mr. EWING. I think that says all shore stations, does it not?

Commander Todd. Coastal stations.

Mr. EWING. Yes. Now, I will explain my position. That is exactly as I understand it. The profitable end, so far as we could ascertain from our investigation of the radio business commercially, lies in the sale of apparatus to ships, or the leasing of apparatus to ships, and in the transmission of messages from high power stations. As an adjunct to the sale of apparatus to ships, it is essential that shore stations be maintained, but the number of messages received by any one shore station or transmitted by any one shore station, so far as we could ascertain, is not sufficiently large to make that business profitable. Now, it seems to me entirely reasonable that the Government should absorb all of those shore stations; where they are really needed for commercial purposes, let them be used for commercial purposes; take over, in other words, the business of receiving messages that are sent from ships at sea and that in no way, so far as I can see, interferes with the sale by private concerns of their apparatus for use on the ships at sea. On the contrary, I believe (although I do not claim to speak as an authority on that subject at all, but from our investigation and hearings we had) it would relieve the manufacturing concerns of what is a burden upon their commercial business. Those stations, the shore stations, will be multiplied and the Government, therefore, should maintain control to avoid difficulty and should buy them now if it is ever going to buy. The big power stations will not be numerous and they can be controlled under regulations which could be instantly put in force, it seems to me, in emergencies. Of course I speak with entire deference to the Navy Department on this.

Therefore this bill, as I say, the main purpose of it, is to take over the shore-station business and to give the Government the right to limit, by license, all wireless business, which I think is absolutely right and essential. Beyond that, personally I do not believe in going, for reasons which may not interest the committee.

The CHAIRMAN. Even from the viewpoint of the manufacturers of apparatus, if the Government supplies the necessary number of shore stations, they would have the same opportunity to sell.

Mr. EWING. To sell to ships.

The CHAIRMAN. No; they would have to furnish apparatus for the shore stations, would they not?

Mr. EWING. Oh, yes.

The CHAIRMAN. Whether they belonged to private parties or to the Government.

Mr. EWING. They probably would: yes.

The CHAIRMAN. But, in the process of time, under private control, the shore stations might be unnecessarily increased.

Mr. EWING. Yes.

The CHAIRMAN. Which would mean a waste of capital and, of course, the disposition is to charge that back on the public; in other words, to make up any possible loss of that sort. So, from a commercial standpoint, whether controlled by the Government or not, there would be only so many shore stations needed.

Mr. EWING. Yes.

The CHAIRMAN. And if the Government undertakes to supply those shore stations, the manufacturers of apparatus must supply those stations, and they would simply supply the need that the commercial stations in a haphazard way undertake to supply now.

Mr. EWING. By shore stations, if you mean what I mean, coastal stations—

The CHAIRMAN. Yes.

Mr. EWING. For communication with ships—we agree entirely on that. What I was talking about was these high-power plants on land, which are not intended for ship-to-shore communication primarily.

The CHAIRMAN. Yes; I perhaps did not get your meaning.

Mr. EWING. It is those, in addition, which the Navy Department proposes taking over, those are the ones I mean.

The CHAIRMAN. Those are high-power stations?

Mr. EWING. Yes.

The CHAIRMAN. You make, then, a distinction between coastal stations?

Mr. EWING. Yes.

The CHAIRMAN. Like the Tuckerton and Sayville.

Mr. EWING. I would not take those over.

The CHAIRMAN. And the one on the Hawaiian Island?

Mr. EWING. No.

The CHAIRMAN. You do not see any good reason why the Government should take over the control of those high-power stations on the Island of Oahu?

Mr. EWING. I have no knowledge of the situation on the Island of Oahu; but I may say, it seems to me if there is a situation there of very great and delicate importance, it can be dealt with as an exceptional case.

The CHAIRMAN. I say, that may be an exceptional case.

Mr. EWING. But my objection is to the Government taking over the wireless business of the whole United States, in all its aspects, excepting the sale of apparatus to ships. That, I believe, would be a mistake. But, as I say, my department is not interested in that and therefore I will not express my reasons unless the committee asks them. But I wish to emphasize the fact that as this bill is drawn, I am entirely in accordance with the purpose and believe in it; so does my department. That is why Commander Todd asked me to appear at this hearing.

Mr. EDMONDS. Mr. Commissioner, when you buy a patented article, or when the Government buys a patented article, suppose the Government wants to go into the manufacture of that article, could it do it without paying any royalty to the patentee?

Mr. EWING. No. That is to say, the patentee could sue the Government in the Court of Claims.

Mr. EDMONDS. And these patentees are now doing that, aren't they?

Mr. EWING. Yes.

Mr. EDMONDS. For infringement of the patents?

Mr. EWING. Yes.

Mr. EDMONDS. And they have the same right against the Government as they would have against an individual.

Mr. EWING. They have the same right of recovery.

Mr. EDMONDS. They have the same right of recovery?

Mr. EWING. But not the right of injunction; they can not stop the Government from doing it.

Mr. EDMONDS. There is no provision of the patent laws that permits the Government to manufacture these machines for their own use without paying any royalty?

Mr. EWING. No; there is not.

Mr. EDMONDS. I was under a mistaken impression about that and wanted to get it clear in my mind. I thought the Government could utilize any patent.

Mr. EWING. The Government can utilize any patent, but it is subject to suit in the Court of Claims for damages. It can not be stopped from doing it, as can a private party.

Mr. SAUNDERS. What, exactly, is meant by "a coastal radio station"; a station necessarily on the very brink of the ocean?

Mr. EWING. It is a station the purpose of which is to communicate with ships at sea in the general neighborhood.

Mr. SAUNDERS. What I am trying to get at is this: Take this station across the river here, can that fairly be called a "coastal station"?

Mr. EWING. It is on the coast, but not a coastal station. It is a high-power station. The radio station at Arlington is one of the great high-power stations.

Mr. SAUNDERS. A coastal station, then, properly, is one immediately along the ocean's brink?

Mr. EWING. It is one intended to pick up messages from ships approaching the shore and to give messages to ships leaving the shore.

Mr. SAUNDERS. The meaning, then, of "coastal station" is rather to be derived from the business it does than its particular location?

Mr. EWING. I think so; except, as a matter of fact, they are located at seaports.

Mr. EDMONDS. If that station at Arlington was in the hands of private parties to-day it would be one of the stations contemplated to be taken over under this bill, undoubtedly?

Mr. EWING. I think not.

Commander Todd. No; not under this bill unless it were licensed to communicate with ships. It could communicate with ships, but would probably not be engaged in that especially; it would be engaged in long distance transmission between distant points.

Mr. SAUNDERS. This section 6—I am not familiar with the entire bill, but section 6 does not seem to contemplate the condemnation of those plants but only their purchase in case the owners desire to sell.

Mr. EWING. The section is based on the theory that as a matter of fact, whatever they may say, the business does not pay them and they will sell.

Mr. SAUNDERS. I see.

Mr. EWING. But if they want to hold on, there is nothing in this section to force them out.

Mr. SAUNDERS. That is what I understood section 6 to mean.

Mr. EWING. Of course, you can understand, these men in the wireless business, if they have something to sell under section 6, are not going to tell us before hand they have something that has no value. You can not blame them for that.

Mr. SAUNDERS. There is nothing else in the bill which compels the compulsory taking over of plants, is there?

Mr. EWING. No; the theory of the bill is only to control by license, not by taking them over.

Mr. SAUNDERS. It contemplates their acquisition—

Mr. EWING. It contemplates their acquisition purely by purchase.

Mr. SAUNDERS. A voluntary sale on the part of the owner.

Mr. EWING. That is it.

Mr. SAUNDERS. Now, with respect to this question of the unnecessary increase of stations and the multiplication of plants, is not that a matter, looking at it from the economic side, that would be controlled like any other competitive business? I take it the people who go into this as a commercial enterprise have in mind profits, just as a man who goes into the telephone business, the railroad business, or any other business designed to supply public wants.

Mr. EWING. Yes; but meanwhile great damage may be done because of the confusion to our commerce or in some emergency.

Mr. SAUNDERS. In what way?

Mr. EWING. By messages not going through, interference with messages in reaching their destination.

Mr. SAUNDERS. You mean if we undertake to increase the number of these stations that it increases the difficulty of using the air as a vehicle of transmission.

Mr. EWING. Of getting a message to a particular person at a particular spot, yes; interference in other words—

Mr. SAUNDERS. In other words there can not be any universal use of the air for commercial purposes; but, of necessity, in the nature of things, it has to be a limited use?

Mr. EWING. It has to be a use where one man is not interfering with another at the same moment.

Mr. SAUNDERS. And it is thought to be necessary for the Government to ascertain, so far as they can, what number of stations may use the air without interference with one another?

Mr. EWING. Yes; and that is largely the purpose, one of the great purposes, of the London convention to which other nations have agreed. Just by way of illustration of the uses that may be made, there is a concern that has a big store in Philadelphia and another store in New York, and it sends out messages ordering socks and things sent from one place to the other, meanwhile interfering with the shipping communications by wireless which can not be made in any other way. Now, such a use seems to be ridiculous.

Mr. SAUNDERS. The effect of that, then, seems to be that in the ordinary relations of commercial business life of the United States the wireless can not be developed for such purposes on account of the fact it will be filling the air with such a volume of sound that it will interfere with other and conceivably more important business?

Mr. EWING. The effect is that the Government can not for its own purposes—that is, for its naval purposes and for the protection of commerce—make the most efficient use of wireless that is now possible.

Mr. SAUNDERS. On the commercial side?

Mr. EWING. Yes.

Mr. SAUNDERS. For instance, what I had in mind was this: Suppose in the development of the machinery that is being used in the connection with wireless transmission, it becomes altogether feasible, in a commercial way, to use the wireless for communication between

this point and Richmond, this point and New York, Chicago, etc., for ordinary everyday business, yet it might not be wise to allow that to be done because it would be interfering with other transmission of greater importance than the ordinary commercial business?

Mr. EWING. Yes. For example, here is a ship at sea; there is absolutely no way of reaching that ship except by wireless. There are plenty of ways for reaching Chicago from here and San Francisco from here besides wireless. Now, if the use of wireless between here and Chicago interferes with the communication between here and the ships at sea, the theory of this bill is that the Government ought not to permit it and ought to regulate it as far as necessary.

Mr. SAUNDERS. Under that view, then, the possibilities of this wireless field, instead of being unlimited, are really very limited ones?

Mr. EWING. The present difficulties are very great. Now, it may be that with the advance of the wireless art, the problem of communication will be so completely solved that one does not interfere with another; but that has not been accomplished.

Mr. SAUNDERS. That was the next question I was going to ask.

Mr. EWING. That has not been accomplished by any means.

Mr. SAUNDERS. I was going to ask, having in mind what has been accomplished by human ingenuity in other fields, whether if this is left free for development and improvement by the ingenious minds working on it that difficulty would not be removed, whereas if we just sit down in advance and say we are going to cut off the possibilities of commercial development because they interfere with what I assume for the time being are more important uses and shut them off in advance, you limit the possibility of development along that line for these great commercial uses.

Mr. EWING. That is true. And the question, I think, that the Congress has to take into account is where it is going to draw the line. We have a present situation and we have the future possibilities. The present situation is that we have an instrumentality for communication that is of great importance to the Government and to commerce, and we ought to get the benefit of them. The future possibility is it may be made very much better. My theory and my objection to the theory of Government ownership is that if the Government takes over the wireless business it will largely be the end of the development of wireless.

Mr. GREENE. That is just what I was going to suggest myself.

Mr. SAUNDERS. That is the very thought I am developing and what my preliminary questions lead up to.

Mr. EWING. Therefore I say I am in favor of strict regulation in this act, and, in my judgment, it does not go too far to meet the present situation. But I am opposed personally—I do not speak for the department, because the department is not interested, but I happen to be the Commissioner of Patents and am interested in that way—to the idea of shutting out or seriously limiting, or limiting any more than is necessary, the field of operation of private enterprise in the development of wireless.

Mr. SAUNDERS. That is just what you no doubt noticed my questions were developing—that thought?

Mr. EWING. Yes.

The CHAIRMAN. Is there anything in this bill that would do that?

Mr. EWING. There is not anything in this bill that would do that. In my opinion that would be a serious handicap.

The CHAIRMAN. Has any apparatus been invented thus far which will control interference?

Mr. EWING. There is apparatus about which claims have been made; I do not believe apparatus which actually accomplishes it, certainly none which accomplishes it in the broad sense. What may be possible nobody can say, but there is unquestionably hope of great advancement. The difficulty about it is that the general methods of communication which make it possible to use one wire to send a number of different messages depend on differences of degree. One current of a certain character will come through strong; another current of a certain character to that same station will come through weak. The strong current will operate the apparatus, and the weak one will not. But where you have the problem of wireless to deal with you have energy dissipated according to the square of the distance. With two stations within a mile of each other and one communicating a thousand miles away, the law of the square of the distance means a million times as great diminution of the strength of the current in the one case as in the other, and therefore you can not rely on initial differences of lengths of current at the sending stations to produce those differential results. I do not mean that is the only way of attacking the problem, but that is one of the ways that was tried and proved a failure.

Mr. SAUNDERS. Just in that connection I want to ask this: The question of the extent to which your message will go depends on the initial power, I suppose.

Mr. EWING. Yes.

Mr. SAUNDERS. What we call the high-power stations?

Mr. EWING. Yes.

Mr. SAUNDERS. Those stations which have, as contrasted with the general run of stations, very exceptional power?

Mr. EWING. Yes.

Mr. SAUNDERS. This station at Arlington is one of them?

Mr. EWING. The station at Arlington is one of them; yes.

Mr. SAUNDERS. Take messages sent out by such a station as that and having, for instance, a little station like the one down here on the Butler Building, I believe—I believe there is a station there?

Mr. EWING. Yes.

Mr. SAUNDERS. Suppose the Arlington station sent out a message designed to reach Panama or, possibly, Hawaii, at the same time this little station was sending out a message designed to reach Baltimore, would the transmission of the message to Baltimore interfere with the Arlington transmission?

Mr. EWING. Oh, no. But, supposing one message from Arlington was going to Hawaii, and, after traveling, say, a distance of something like 5,000 miles, you found there, in sight of the Hawaiian receiving station, a little transmitting station transmitting to one of the little islands of the group, its waves would react right there, and that would prevent the receiving of the message.

Mr. SAUNDERS. Transmission at the receiving end would bar its receipt?

Mr. EWING. Transmission at the receiving end would prevent its receipt.

Mr. SAUNDERS. But not so with competitive transmission at the transmitting end?

Mr. EWING. Not of this little one here; no.

Mr. SAUNDERS. Out at sea, then, the trouble that arises, if I follow what you just stated, is not so much these little stations as it is the other ships; it is the messages that are being sent out by the ships? Pretty much all the commercial ships of any size are equipped with wireless now?

Mr. EWING. I do not think they send so many messages from the commercial ships themselves.

Commander TODD. They send them, but it is more scattered and not so congested as it is in the large ports.

Mr. ROWE. But the sending to ships in the port would be interfered with?

Mr. EWING. Yes.

Mr. SAUNDERS. These ships are interfered with by what?

Mr. EWING. They are interfered with by their own messages and, possibly, other commercial stations.

Mr. SAUNDERS. You say the ships do not send many messages? I have been out on a good many ships, and they seemed to me to be about as busy sending as receiving.

Mr. EWING. That statement is perhaps extreme. The real statement is the ships have got in some way to take care of themselves. The apparatus is there to be used, and they have to take care of themselves, because if they do not they will, of course, put themselves all out of business. But we ought not to be building upon the shore stations that are unnecessary to the business.

Mr. SAUNDERS. Which would interfere with them?

Mr. EWING. Yes.

Mr. SAUNDERS. I agree to that; but what I was trying to get at was whether the problem, so far as ships are concerned, is not one which arises out of competition and the trouble they make with each other rather than the little commercial wireless developments on land, particularly little interior stations.

Mr. EWING. That would depend. Take, for example, the port of New York. There, of course, the difficulty of wireless transmission is already very great because of the great number of ships coming in. Now, to have a little station in New York City transmitting a perfectly unnecessary message to Philadelphia—I mean a message that could be sent in some other way perfectly well—it seems to me is absurd.

Mr. SAUNDERS. That would interfere, then, with the receiving of messages on those ships?

Mr. EWING. In the neighborhood of New York; yes. And that sort of thing is likely to develop unless we could control that.

Mr. HARDY. It would interfere with receiving messages from the ships that were reaching their destination.

Mr. EWING. Yes; interfere more that way than the other way.

The CHAIRMAN. The ship with the high-power apparatus would smother out the ship with the weak apparatus, depending on the distance out?

Mr. EWING. Yes; but the ships being fairly scattered, and their apparatus, I suppose, fairly standardized, I do believe the commercial companies can handle those aspects of the commercial busi-

ness; that their interests will lead them to do that, and that the thing will develop satisfactorily, so as to get the largest use of the apparatus. But what we ought to do is to maintain the very best conditions for that activity.

Mr. SAUNDERS. Then, Mr. Commissioner, having that in mind, I would like to ask this question. Low-power wireless stations in the interior, for instance, St. Louis doing business with Chicago—those stations would not in any wise interfere with ocean receiving, would they?

Mr. EWING. I do not believe so. I believe that could be met perfectly satisfactorily and could be operated perfectly satisfactorily, so far as I know the art. I am not an expert on wireless; I am only answering the best I can.

Mr. SAUNDERS. Then this problem of working out devices to get away from this difficulty of interruption is one that is being worked on continually now, is it not?

Mr. EWING. Yes.

Mr. SAUNDERS. I see a great deal about it in the press.

Mr. EWING. Yes; and large claims are made for apparatus; but I think the success so far has not been large.

Mr. SAUNDERS. But, of course, if that can be developed, the machinery and devices for the purposes can be developed, the difficulty suggested in the way of interruption would pass; that would be dissipated, and the necessity for this taking over would be minimized to that extent?

Mr. EWING. Yes; it would be minimized to that extent.

The CHAIRMAN. That is, if we compel them by law to use the other devices?

Mr. EWING. Yes; and they would quickly enough use them if they could, because it is highly desirable. Secrecy of communication would be of vast advantage commercially.

There is one other thing I would like to say somewhat by way of apology. Ever since I have been on this committee that drafted the bill I have been rather in an attitude of opposition to the Navy Department, which has always been strongly for greater control, and, in fact, for Government ownership, and I wish to say it is not at all from lack of appreciation of some splendid work that the Navy Department has done in this field. But I did not think that the Navy Department, or any department of the Government, is organized for purposes of investigation and development of the sciences and arts such as wireless, and that if the Navy Department gets control of it it is not at all probable the advance will be such as it will be if we can leave the field largely open to private enterprise.

Mr. HARDY. Mr. Commissioner, have you noticed any tendency or disposition or effort toward monopoly in private hands of the control of the wireless?

Mr. EWING. Of course the Marconi Co. tried very hard to maintain a monopoly, but it did not succeed very well with its patents.

Mr. HARDY. Up to now no monopoly has been established?

Mr. EWING. No; there is no monopoly.

Mr. HARDY. And up to now the Government really owns a vast deal more than half of the wireless service of the country, does it not?

Mr. EWING. I am not able to say. Possibly the Department of

Commerce could tell you that. Mr. Chamberlain might answer that for you.

Mr. HARDY. I think, Commander Todd, you said yesterday that the Government's wireless service cost probably ten times as much, did you not, as the private wireless?

Commander Todd. Yes, sir; we have in our stations and we buy the latest apparatus as fast as we can get it, but the commercial stations, the shore stations, do not keep up with progress to the same extent that we do, and I take issue right here with Commissioner Ewing on the subject of the suppression of the art in the Navy Department. We have always been one of the leaders in advancing the art.

Mr. EWING. I said nothing about the Navy Department suppressing the art.

Mr. HARDY. If you were to take the Government out of this business, mainly would not the effort be, for commercial uses especially, to monopolize it by a large enterprise?

Mr. EWING. It might result in one single wireless company controlling the entire business; and if it did, it would be because that was eminently desirable.

Mr. HARDY. Just as combinations in shipping and other things like that?

Mr. EWING. I do not know about that. But if it won out, it would be because the wireless field lent itself to that method of development.

Mr. HARDY. You think, in other words, if it did result in monopoly, it would be best for it to do so?

Mr. EWING. I think it would only result in monopoly if it were best for it to do so.

Mr. HARDY. The two statements are very nearly the same.

Mr. EWING. Well, I think not.

Mr. HARDY. You think it would be best if it did, whether because it was best or not. Now, then, I want to ask you this: Your objection to Government ownership is that if the Government become the owner, then all future development would stop.

Mr. EWING. I think it would check future development.

Mr. HARDY. Have you any reason for thinking that a monopolistic private owner would be any easier for the development, or any better for the development, than a monopolistic government owner?

Mr. EWING. Yes; and I can tell you why.

Mr. HARDY. The outsider could not operate in either case, could he?

Mr. EWING. I will give you my reason, if you want it.

Mr. HARDY. Yes.

Mr. EWING. My reason is that the private owner, whether monopolistic or otherwise, is in business to make money. It is a commercial concern and the problems are treated as commercial problems. Where development is possible, if it pays it will be financed. The men who have displayed talent will be employed for that purpose and will not be assigned to other duties. If the Navy Department has control of the wireless men will be selected according to Navy discipline; a man who has succeeded in one particular line will be transferred to another line simply because of Navy discipline. The men are not selected because they are investigators; they are selected to make naval officers, and the thing is treated as a Navy matter, not as a matter of the development of wireless.

Mr. HARDY. Let me make this suggestion to you and see if you think there is anything in it: As long as there is private competition unquestionably each competitor is seeking to improve his apparatus and instrumentalities, in order, as you say, to make money. But when you get a monopoly isn't it true that a monopoly of any necessity becomes independent of exertion; and isn't it true that many appliances, new inventions, and new patents, have simply been bought out in their infancy and laid on the shelf because the monopolistic interest did not care about disturbing their investments by the introduction of new patents and new processes?

Mr. EWING. I have no doubt that happens.

Mr. HARDY. Now, right along that line, is it not less likely to be true that the Government would lay aside useful patents when it had a monopoly, than the private owners having a monopoly, bearing in mind the necessity for making profits, would lay aside useful patents?

Mr. EWING. I would answer that by saying if the Government had it, I think there would be very much less likelihood of useful patents being developed, because the Government would not treat it as wisely as commercial development would treat it. Let me give you an illustration, if I may.

The CHAIRMAN. I am a member of the Committee on Patents, and I have heard that question mooted often in that committee. There are thousands of patents lying dormant in your office to-day that have been taken over and are controlled by great corporations in this country, the use of which would involve increased expenditure, although they might increase efficiency and cheapness of production, simply because they do not want to involve themselves in the expense of throwing out machinery that is fairly efficient now, or processes that are fairly efficient now; and for that reason the art itself or the development of the interest in it is retarded and inventors are discouraged to that extent. And I can not, to save my life, see any reason why the Navy Department, by its control, or the Government by its control of this art, would be disposed to stifle it. On the other hand I can see every incentive to stimulate and give the inventor every opportunity to develop the art.

Mr. EDMONDS. Mr. Chairman, if I may say something right at this point, if you will bring out that bill I introduced before your Patent Committee, then we won't have any more patents sequestered. I have been trying to get a hearing on it, but have not been able to do so to date.

The CHAIRMAN. You never came before the committee while I was there.

Mr. EWING. If it would make things cheaper, the patents would not be suppressed. If the new suggestion involved scrapping of vast amounts of apparatus and plant, you can not scrap them and say there can be no charge for it—not as a commercial proposition. I know the chief engineer of the American Telegraph & Telephone Co. in New York (I have known him for a great many years), Mr. Carty. He is one of the ablest engineers in the world. Mr. Carty told me himself on one occasion, a good many years ago when I was engaged in some negotiation, that it was only necessary for him to write his name to a statement that by the expenditure of a given sum of money he could save 5 per cent of that amount per

annum in an improvement of the apparatus, and it then became the duty of the financial department of the company to supply him with that money, whether it was a thousand dollars, a million dollars, or ten million dollars. Now, that means commercial development, and there is not a wisely operated commercial concern or branch of business in the world that does not treat the problem of development in that way. But the Government does not treat things in that way; the Government is not a business concern.

Mr. HARDY. Mr. Ewing, right along that line, do you not know hundreds of instances of a private enterprise absolutely keeping new inventions on the shelf for years and years, like the automatic car coupler; and, just like Judge Alexander was saying, that each manager feels an honest pride for different reasons, and one of them, I fancy, is a pride in showing a big income, a net surplus. And is it not almost axiomatic that industries hesitate, as long as possible, about scrapping old apparatus, and putting in new apparatus because of the cost and uncertainty of making new changes, and do they not wait until somebody else, outside, demonstrates the success of the thing and then gobble it up, if they can?

Mr. EWING. That is true of all business—that is always true.

Mr. HARDY. Now, then, I want to ask you if the Government would not be in shape to give the patentee, the inventor, a better showing to make his invention go than these monopolistic interests that put thousands of patents on the shelf every year?

Mr. EWING. Oh, that statement I deny; they do not put thousands of patents on the shelf every year. Thousands of patents go on the shelf every year because thousands of suggestions are made as to changes in business that are not worth the doing, not worth putting into effect.

Mr. HARDY. Do you think everything that is worth anything goes into use right at once?

Mr. EWING. No; because nothing in human life is perfect, and you can not make it so.

Mr. HARDY. What is your opinion as to the statement of Judge Alexander, "That monopolistic business is slow and does suppress useful patents rather than junk old apparatus"?

Mr. EWING. All business is slow to junk old apparatus. Every inventor, who has a new idea, has to fight his way, not only against the manufacturers, but against the people on the street who buy the things.

Mr. HARDY. If he has to go up against a manufacturer, and that manufacturer is a monopolistic private owner, isn't he in harder lines to get a hearing for his invention than if the Government owned it?

Mr. EWING. No, sir; I would very much rather, so far as my own experience is concerned, deal with a private concern than with the Government.

Mr. SAUNDERS. Is it not notorious that all inventors complain, in all parts of the world, that it is difficult to get a sympathetic hearing for their invention than is developed by this process where the Government is in control?

Mr. EWING. I think that is true.

Mr. SAUNDERS. And there is no more complaint against anybody than there is the Navy Department, particularly.

Mr. EDMONDS. I could give you an illustration of that, if you would like to have it.

Mr. GREENE. I will say this, that in my own city, where there is a large manufacturing development, they scrap thousands and thousands of dollars worth of machinery every year, whenever they can find an improvement. They do not take every improvement brought to **their** attention. And they have just as smart men connected in the manufacture of cotton goods there as anywhere in the world, and they scrap thousands and thousands of dollars worth of machinery. And I have been South, *years ago*—I have not been of late years, but 30 years ago—and I found in **going** into a mill, in which a party wanted me to interest northern capital, **machines** which had been discarded from mills in my own city were being used there. They do not do it now; they use modern machinery; but they did then. And I know they scrap thousands of dollars worth of machinery every year that becomes useless because of improvements that have been brought to their attention.

Mr. HARDY. Those cases, however, Mr. Greene, are cases where strict competition has to be maintained, where they scrap them.

Mr. EWING. I am not at all suggesting that this wireless business will become a monopoly. I do not know anything about it. But my own personal conviction is that it would be an unwise thing to have the Government take it over.

The CHAIRMAN. I am not undertaking to say what the practice is, but I can very clearly see what the motive and policy should be on the part of the Government. It may be narrow and self-centered, and all that, but that is something I do not know anything about.

Mr. EWING. The naval officers—for example, Commander Todd is now in charge of the radio work. Capt. Bullard was the head. I do not suppose Capt. Bullard was ordered off to some other wireless business. They do not pick out a man who distinguishes himself in wireless and say, "You devote your life to wireless"; he has to be a naval officer. But in private life the man devotes his life to it.

The CHAIRMAN. I expect Capt. Bullard has had more experience along that line than any expert here representing the other interests to-day, because, as an agent of this Government, he visited all the wireless stations of Europe and made a special study of them.

Mr. EWING. What is Capt. Bullard engaged in now?

The CHAIRMAN. He has been transferred to some other duties.

Mr. EWING. Yes; exactly. A private concern would not treat a man like that.

Commander TODD. I will have Capt. Bullard here to-morrow.

Mr. EWING. I understand he can come here. But that is the way they are treated by the department, and that is the way the Navy Department has treated everybody. I am not criticizing the Navy Department; they are running their own department. But, as a matter of encouraging scientific investigation, the Government is not a shining success in comparison with private enterprise.

The CHAIRMAN. Yes; but these gentlemen here are not inventors; they are not the men who develop the art. It is the fellow outside, the man who is unknown to it, who develops it.

Mr. EWING. Sometimes.

The CHAIRMAN. And they are the ones we do not restrict. We do not want to hamper them; we want to encourage them.

Mr. EWING. Neither do I wish to hamper them.

The CHAIRMAN. The only point I make is that in the light of past experience, I can not understand why development would not be encouraged even though the Government should control, as well as if in a monopolistic control. Now, here is the Marconi system, and there is another system; they are both powerful systems. I have heard experts say that one was better than the other. Both are trying to get the upper hand.

Mr. EWING. That is a very healthy situation.

Mr. EDMONDS. There is one thing certain, and that is, it will not tend to the development of the wireless for the Government to take over all the wireless stations. I think Mr. Ewing is perfectly right on that, and I think Mr. Ewing's statement is absolutely true, from my personal experience with regard to patents. You can get a patent; it may be a more economical machine, a little bit more economical than the one at present used. I have a case in mind, one of my own, that I have been interested in for some time. But you can not get the customers to scrap millions of dollars worth of material for the sake of putting on something that is a little bit cheaper. You can not do it, because they simply will not. The case I have in mind is an air brake. It is really the same as the Westinghouse air brake and could be built cheaper than the Westinghouse air brake, but there is a question as to the interchangeability of this air brake with the Westinghouse air brake which has not been settled. The railroads have spent hundreds of millions of dollars equipping their entire rolling stock with the Westinghouse air brake to-day, and they can not afford to throw away the air brakes on the cars to-day for the sake of putting on one that could be manufactured for \$5 or \$10 cheaper.

The CHAIRMAN. They could not afford to put it on all, but could they not put the one that is cheaper on the new cars as they are built?

Mr. EDMONDS. They can not because they are not sure that air brake will interchange with the same efficiency with the Westinghouse air brake; and if they put it on, and at some time it should fail to work, there would be a tremendous loss of property and loss of lives on account of that lack of interchange.

#### STATEMENT OF MR. E. T. CHAMBERLAIN, COMMISSIONER OF NAVIGATION.

Mr. CHAMBERLAIN. Mr. Chairman and gentlemen, I will only take a few moments of your time, as, in a sense, in this particular measure the Department of Commerce is somewhat subordinate. But with your permission I should like to read the letter of the head of the department, Secretary Redfield, because I think that will save time, and it is a concise statement of the reasons why the department favors the measure most earnestly. This is addressed to the chairman of this committee, and reads as follows:

JANUARY 8, 1917.

SIR: The department has received your letter of December 23, inclosing H. R. 19350, a bill to regulate radio communication, and asking me to give your committee the benefit of such suggestions as I may care to make regarding the desirability of enacting the bill into law.

The bill is the result of the deliberations for a year of a committee on which all the departments were represented, created at the request of the Secretary

of the Navy, to revise the act to regulate radio communication, approved August 13, 1912. That act has been enforced economically for four years by the Department of Commerce, with results, in the main, satisfactory. Under its operations the art of radio communication has made material advances, international obligations have been fulfilled, the orderly use of this means of commercial communication have been greatly extended, and the safety of human life at sea—and incidentally of property—has been increased during a period when it has been subject to terrors hitherto incredible. The bulk of the pending bill is a more orderly arrangement of the provisions of the act of 1912, expressed with greater clarity, and modified in details in the light of nearly four years' experience. In addition to these changes, however, the measure involves several matters of prime importance to the present conditions and future development of radio communication under the jurisdiction of the United States, to which I wish to invite special attention.

The principal features of the bill now submitted are the provision in section 5 by which all Government radio stations are to be open to the transaction of general commercial business in competition with radio stations operated by private commercial companies, and the provision in section 6 by which the Navy Department is authorized to purchase at a reasonable valuation any coastal radio station (a station on land or on a permanently moored vessel, used for exchange of correspondence with ships at sea) which the owner may desire to sell.

These two propositions must be read together, as the department would not favor, and assumes that your committee would not care to consider, a proposition to put the Government of the United States, as a permanent policy, into competition with private corporations in the business of exchanging commercial radio messages between ships at sea and coastal stations in the United States. The two propositions taken together contemplate the establishment of a Government monopoly under the Navy Department in the exchange of radio messages between the coasts of the United States and ships at sea through the exclusive ownership and operation of all coastal stations by the Navy Department, except in so far as the other departments of the Government in the discharge of their duties are required to maintain and operate radio stations. The department is disposed to believe that the bill should also provide for the purchase and operation by the Navy Department of very high-powered stations used for transoceanic radio communication between the United States and foreign nations, as, for example, the Sayville and Tuckerton stations connecting the United States with Germany, and stations connecting Hawaii with the Pacific coast and with Asia, because the argument for the ownership by the Government of such stations is even stronger, as events have already demonstrated, than the argument for exclusive Government ownership of coastal stations.

I might add, on that part, that I believe very strongly in that. That is as far as the Secretary cared to go in expressing himself on the way of a suggestion. If a proposition should be advanced to amend the bill to cover that point, as I understand the Secretary of the Navy has already done, why we would be in accord with it, I am very sure.

The bill in effect invites a declaration of general policy by Congress, and if enacted it should be followed by the appropriations required to give it effect. The situation is briefly as follows:

In the interest of safety of life at sea and of commercial intercourse between merchant ships and between merchant ships and the coasts of the world private corporations have established extensive systems of radio communication, and these systems have been extended rapidly, especially under the stress of war. These systems consist of wireless stations on shipboard and wireless stations at suitable points along the coast. The ships of the Navy, of course, are fitted with radio apparatus, and Congress, from time to time, has appropriated funds with which an extensive system of naval wireless stations along the coast has been established and operated by the Navy Department.

These two systems of coastal stations, one owned and operated by the Navy Department and the other by private companies, not only involve an economic waste to the people of the United States, who must support directly or indirectly both of them, but they also at times and in places interfere with each

other and prevent each other from efficient operation, owing to the imperfect development of the art of radio communication. The volume of naval business transacted by the coastal stations of the Navy Department is not sufficient, this department understands, to give profitable employment to those stations in ordinary times, although those stations also transmit and receive messages for this department and all other departments of the Government which own and operate shipping. The coastal stations operated by private corporations, this department understands, do not in themselves transact enough business to be a source of profit to their owners, but are maintained as part of systems embracing both ship and coastal stations. Your committee will doubtless obtain from the Navy Department and from the companies concerned complete information on these matters. If one system of coast stations will suffice to meet the needs of both the commercial public and the Navy Department more effectively and more economically than two or more systems, the department believes that Congress may well take the steps necessary to the ultimate establishment of that one system.

Occupation and complete control by the Navy Department of all coastal stations in the United States communicating with ships at sea would be one of the first and most necessary measures in the event of a war involving the United States. This basic fact can not be overlooked, and its consequences should be forestalled. It involves the employment at a moment's notice of a body of wireless operators, not only highly skilled, but of reliability.

Even during the present European war it has been deemed necessary to subject such stations to a naval censorship, involving the employment of a considerable force of naval officers and enlisted men who do not operate the stations, except at Sayville and Tuckerton, but whose cost is a tax upon the people, while the costs of operating the stations by private concerns remains as before the war. Even in ordinary times Congress has deemed it desirable to establish and maintain a chain of naval stations along the coasts of the United States to permit a direct communication with the fleet and other Government ships through instrumentalities owned and operated by the Government exclusively. These three considerations, (1) the necessity for complete Government possession and operation of coastal stations during war, (2) the need of Government censorship during a war between maritime powers when the United States is not a participant, and (3) the desirability recognized by Congress for some years of direct and independent Government communication at all times with the fleet distinguishes clearly the proposition for Government ownership involved in this bill from suggestions for Government ownership of telegraph, railroads, etc. Furthermore, the Government system and the private systems, in fact, at the present time actually interfere with each other, and each deprives the other to an extent and at various times and places of its full measure of usefulness.

Indeed, to meet this difficulty the bill provides in section 24 that all important seaports and at other places indicated there shall be, under certain conditions, an arbitrary division of time, the Government and private stations each operating only during alternate hours throughout the 24 hours. This plan is offered only as a temporary device, and it will not be contended that it is a permanent and satisfactory solution of a difficulty. Indeed, resort to this device in itself indicates the desirability of one system entirely operated by the Government.

Congress in the original act to regulate radio communication, approved August 13, 1912, foresaw and provided in part against some of the difficulties of present conditions by authorizing, in the eighteenth regulation, the transaction of general commercial business by certain Government stations and by prohibiting or limiting the installation of new private commercial stations in the vicinity of Government stations, and in the twelfth regulation by providing for a division of time. The principles, accordingly, on which the pending bill is based, are not wholly new to our legislation, and the bill is rather an extension of the application of principles in the light of the experience and development of the past four years. The argument for the ownership and operation of all coastal stations in the United States communicating with ships at sea was set forth somewhat fully in the report of the Commissioner of Navigation for 1911 (pp. 56-58).

With the permission of the committee, I would like to incorporate those pages of the 1911 report in the hearing.

The CHAIRMAN. There will be no objection to that, I take it.

Mr. HARDY. I suggest that you might let that report follow after this letter which you are now reading.

Mr. CHAMBERLAIN. Very well.

In details the bill differs from the act of 1912 mainly in the following particulars:

Section 14 specifically authorizes the censorship which it has been found desirable to establish by Executive order during the European war.

Section 5 specifically authorizes the Secretary of Commerce to approve the rates of commercial stations. The London International Radiotelegraphic Convention (art. 10) prescribes that coastal and shipboard rates shall be subject to approval by the Government on which the stations are dependent, and as under the act of 1912 the Secretary of Commerce was authorized to issue licenses and carry out the convention, the approval of rates was held by the department's solicitor to be a necessary incident with implied authority, resulting from the act. Section 5 removes any doubt which may exist on this point.

Section 7 imposes restrictions on the alien ownership of stations operating in the United States, and section 12 restricts the issue of operators' licenses to American citizens except on merchant ships, because in foreign ports American ships which from any cause may lose their American operators may not be able to secure other American operators.

The Department of Commerce recommends the passage of the bill.

Respectfully,

WILLIAM C. REDFIELD, *Secretary*.

Hon. J. W. ALEXANDER,

*Chairman Committee on the Merchant Marine and Fisheries,  
House of Representatives, Washington, D. C.*

(The extract from the report of the Commissioner of Navigation for 1911 is as follows:)

#### GOVERNMENT OWNERSHIP.

The desirability of Federal regulation of radiocommunication compels attention to the essential difference between the relations of wireless telegraphy to the Government of the United States and to the governments of all the other great powers. A brief inspection of the list of wireless shore stations of the world in Appendix M (compiled from the useful list, giving various important details, of the Bureau of Steam Engineering, Navy Department) will well repay any man who desires to acquaint himself with the situation throughout the rest of the world, and in the United States. That glance will show that in virtually every other country and in all the great colonies of European countries the wireless shore stations are owned and operated by the governments, respectively. In Great Britain and Canada there are some commercial wireless coast stations, but it will be noted that the territory which each may cover is also covered by a Government station. Discriminating examination of the list will also disclose a complete cordon of American naval wireless stations around the coast from Maine to New Orleans, branching off to Porto Rico, the naval station at Guantanamo, Cuba, and the Canal Zone, and thence up the Pacific coast to Unalaska and the Pribilof Islands, with "branch lines," so to speak, to Hawaii, Guam, and the Philippines. The Japanese Government carries the principle of government ownership further than European powers, and the Japanese trans-Pacific passenger steamships are equipped with apparatus furnished by the Government and operated by employees of the Government.

The extent of government ownership abroad is due primarily to the fact that wireless telegraphy is operated as a branch of each country's general telegraph system, and the telegraph systems are organized under and managed by the post office departments of each country, respectively, with which they have obvious and necessary connection anywhere.

There is another reason, however, for the extent of government ownership of wireless telegraphic systems. Land-telegraph lines fall entirely within territorial jurisdiction. They can at any time, if necessary, be seized, controlled, or cut off entirely by a simple pair of nippers. While submarine transoceanic cables are under international protection (Navigation Laws, 1911, p. 443), license to establish a cable landing and shore station must be secured from government. In our war with Spain the facility with which ocean cables may

be cut as a measure of offense or defense was repeatedly demonstrated. From its nature, wireless telegraphy pays no heed to territorial boundaries. It can be controlled in event of war, or, even further, in the tense and vital periods of preparation which immediately precede the actual declaration of war, only by the most searching and complete surveillance of government. The reasons for complete government control of wireless coast stations appeal even to the mind to which the general theory of government ownership is objectionable. In the event of war involving the United States—improbable, but still possible—we should find any possible antagonist equipped to-day, and long before a possible declaration, with virtually complete control of all the wireless systems within his jurisdiction.

Our preparation consists of a complete naval coast system, with the admirable interior military system of the Signal Corps, but in addition there are numerous commercial stations of more or less efficiency which would have to be put at least under surveillance and probably would have to be taken over entirely by Government.

In peaceful times, like the present, the commercial system of the United States in respect of wireless telegraphy presents a striking example of economic waste. We have a Government seacoast system, maintained by Congress, so complete that it is within bounds to say that any ship equipped with wireless apparatus under the wireless ship act of 1910 can be in communication with a naval shore station at all times on voyages along the coast between ports 200 miles or more distant. This Government system is duplicated at some points and to a greater or less degree of efficiency by commercial stations owned and operated by four or five corporations. It is no trade secret that thus far these corporations have not declared large dividends. Possibly in some instances the returns have been invested in experiments or improvements; possibly plants have been erected ample to supply a future rather than the present demand, and there may have been even instances where stock has been issued on no more tangible an asset than the ether itself. Waiving the matter of national defense, the dual system of Government and private shore stations means wastefulness to the people of the United States. This waste, from the nature of things, must increase as competing companies extend their plants and duplicate among themselves apparatus, stations, and operators, or one company will in time absorb the others and establish a monopoly.

The situation has been brought home to this bureau in the enforcement of the wireless-ship act. One company, which has equipped many trans-Atlantic steamships, has no Pacific coast stations in the United States. Several other companies have various vessels equipped, but only limited shore facilities. So far as possible Congress has regulated the situation by providing for compulsory interchange between systems, but there can not be cordial cooperation when one company must devote its shore plant, representing considerable investment, to aid a competitor without any shore equipment, in competing with it for business on shipboard. The naval coast stations, in the last analysis, are the immediate guaranty that the law can and will be effective.

In the light of experience it is probable that, if we had now to meet at the beginning the question of land-telegraph lines, the United States would have assumed the ownership and operation of them as other nations have done. Our telegraph systems now represent an immense investment and, even if acquisition were deemed desirable, which is not here for a moment intimated, the cost to the Treasury would be very large. Commercially the wireless systems in the United States are infants. One, for example, with a nominal capital of hundreds of thousands, represents an actual investment of \$30,000. The principal companies at the present time are engaged in expensive litigation over patent rights. That the companies are thus involved is not a reason for taking advantage of weakness and dissension. It is, however, a contributory disclosure of the fact that the actual investments thus far made are small and not yet of assured value.

If it should be deemed desirable for the Government of the United States to acquire the same ownership and control of wireless stations within its limits which other nations have acquired virtually from the outset, that result can be brought about, with adequate consideration for all bona fide investments of individuals, at much less cost and with much less disturbance to the established order of things now than in the course of a few years. There are, of course, some obvious objections to the suggestion, and it may be urged that the course of invention would be hampered by Government ownership. The suggestion, not

recommendation, of Government ownership has been made with diffidence, because it has been forced by experience upon the bureau, at the outset opposed on conviction to the principle involved. The matter is too large and involves too many questions to be the basis of recommendation by an ordinary bureau.

I may say, apropos of the last paragraph of the secretary's letter, that if an amendment is offered to provide that all operators on American ships must be Americans, I want to have a chance to say something on that subject; because, as matters stand, I am very much opposed to any proposition that is going to restrict American ships and make it more difficult to run them than at present. But that may not come up.

Mr. HARDY. I would just like to ask you—you have had a great deal of experience in framing laws, possibly laws along this line?

The CHAIRMAN. He assisted in the framing of the original radio law.

Mr. HARDY. Section five says the Secretary of Commerce shall approve the rates charged by licensed stations open to public correspondence. Do you think that section gives the right to the Secretary of Commerce to fix the rates charged?

Mr. CHAMBERLAIN. To approve.

Mr. HARDY. It just says he shall approve all charges or rates.

Mr. CHAMBERLAIN. The reason that wording is used is because it is the language of the international convention and it seems to me it carries with it the power to fix rates; because if the Secretary does not approve the rate, the license to the station does not issue.

Mr. HARDY. You are aware of the fact that the Interstate Commerce Commission for a number of years after it was created supposed it had the right to fix rates under the phraseology of the bill creating it, and after some 10 years of operation the Supreme Court decided they had no right to fix rates. And then Congress had to amend the act. Don't you think that language, if it is intended to give the Secretary of Commerce the right to fix rates, could be made a whole lot plainer than by just saying he should approve the rates charged by the companies? In other words, he has the right of approval, but he has not any right of fixing rates.

Mr. CHAMBERLAIN. I may say, Judge Hardy, that in the drafting of the bill by this general committee that question was raised. The reason the word "approve" was used is because the international convention, in article 10, reads:

All coastal rates shall be subject to the approval of the Government on which the coastal station is dependent, and shipboard rates to the approval of the Government on which the ship is dependent.

We took the language of the convention. Now the question was raised as to whether that meant to fix the rates, or not, and Mr. Warren, the Assistant Attorney General, for whom we all have very high regard, took the view the use of the word "approve" would carry with it the right to fix, and that it was adequate. But as I am not as familiar with the decisions of the Supreme Court and the operations of the interstate commerce law as I wish I were and as you surely are, I am frank to say I do not know about that.

Mr. BURKE. Isn't it possible, Mr. Commissioner, that the word "approve" may be used by the English in the sense of "fix" and there is a slight distinction in its meaning with us; and why not express that idea in our own language?

Mr. CHAMBERLAIN. That, of course, is quite possible; but the convention—

Mr. BURKE. Suppose you had an ambiguity in it—

Mr. CHAMBERLAIN. If you will pardon me—the original London convention is in French, and that is our translation of it.

The CHAIRMAN. Section 5, the first paragraph, says:

That the Secretary of Commerce shall approve the rates charged by all licensed stations open to public correspondence.

That would refer to other than American stations.

Mr. CHAMBERLAIN. Yes; ship and coast as well.

The CHAIRMAN. The second paragraph provides:

The heads of Government departments having jurisdiction over Government land stations and Government ship stations shall, in their discretion, so far as it may be consistent with the transaction of Government business, open such to general business and shall fix the rates for such service.

Don't you think the meaning of the word "approve" in the first paragraph, to all intents and purposes, is the same as "fix the rates" in the second paragraph?

Mr. CHAMBERLAIN. I think, Judge, if you will allow me, the same word should be used in both cases; otherwise you will create a distinction and differentiate the word "fix" from the word "approve." And I am frank to say I did not know the two words were used; I overlooked the fact. We had a discussion on the fixing of rates by the Secretary of Commerce, but I do not think I paid much attention to that. As originally drawn, we had "fix" in both cases, and somebody suggested "approve."

The CHAIRMAN. In any event, I take it for granted the intent of this is that the same power should exist in each case.

Mr. CHAMBERLAIN. Exactly, and the same word should be used.

The CHAIRMAN. And when a station applies for a license to transact commercial business, the department is given the power to approve the rates. That means fix the rates; it can not have any other meaning.

Mr. HARDY. I would just like to suggest along that line that after long years of litigation about it, the Interstate Commerce Commission was given that authority by language which is unquestionable; and I believe if we pass this bill we ought to incorporate that language.

The CHAIRMAN. I think so, too.

Mr. BURKE. It strikes me, as a country lawyer, that this first paragraph may be construed as regulating such rates as the stations may charge.

(Thereupon, at 11.50 o'clock a. m., the committee adjourned until to-morrow, Saturday, January 13, 1917, at 10 o'clock a. m.)

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HOUSE OF REPRESENTATIVES,  
COMMITTEE ON THE MERCHANT MARINE AND FISHERIES,  
Washington, D. C., January 13, 1917.

The committee met at 10.30 o'clock a. m., Hon. Joshua W. Alexander (chairman) presiding.

The CHAIRMAN. You may proceed, Commander Todd.

Commander Todd. Mr. Chairman, the Commissioner of Navigation was detained to-day and can not continue his testimony before

the committee until Monday, or some later date. With your permission, I will ask you to hear Lieut. Waesche, representing the Treasury Department, the communication officer of the Coast Guard.

**STATEMENT OF LIEUT. R. R. WAESCHE, UNITED STATES COAST GUARD.**

**The CHAIRMAN.** Please give the committee your name and official position.

**Lieut. WAESCHE.** R. R. Waesche, second lieutenant, United States Coast Guard. Of course, as I represent the Treasury Department I am bound more or less by the views of the Secretary, and for that reason I would like to read the letter which the Secretary has addressed to the committee, and that will fully put forth his arguments more clearly and concisely than I could do in my own words. His letter is dated January 5, 1917, and is addressed to the chairman of the Committee on the Merchant Marine and Fisheries, House of Representatives. The letter is as follows:

SIR: I am in receipt of your letter of December 23, 1916, inclosing copy of bill (H. R. 19350) to regulate radio communication, and requesting that the committee be given the benefit of such suggestions as this department may care to make as regards the desirability of enacting the bill into law.

This bill involves the principle of Government ownership of coastal stations, and while it is a move in that direction it does not definitely provide for such Government ownership. It is the belief of this department that the principle of Government ownership of coastal and commercial stations is sound, and it is further believed that the bill should provide for Government ownership rather than treat of this principle in indeterminate fashion. The chief arguments in favor of Government ownership of this public utility are entirely separate and distinct from those in favor of Government ownership of other public utilities, and I desire to particularly emphasize that this letter is not to be taken as indicating in any degree whatever the views of this department concerning the principle of Government ownership in any public utility other than radio communication. It will be noted that radio signals can not be confined to definite channels, but are transmitted through a medium to which no specific title can be conveyed to individuals or corporations, and therefore radio signals are not amenable to the ordinary measures of control. Where two or more stations operate in close proximity as in the case to-day in many places, they mutually interfere—resulting in confusion, the hampering of radio traffic, and embarrassment to vessels in the vicinity depending upon this means of communication. This condition is particularly emphasized in congested commercial districts, such as New York and other important seaports, and it can be effectively obviated only by placing all stations under one control. It therefore appears that to save embarrassment to the Government, to shipping, and maritime interests in general as well as to the public—all due to radio interference—the Government should exercise full control over this means of communication as far as practicable, and this can be effectively accomplished only through Government ownership and operation of all coastal and commercial stations.

Radio apparatus on board ship is the greatest value as providing a means for summoning aid should the vessel be in trouble. When such a distress call is broadcasted, experience has shown that the majority of the ship and shore stations in the vicinity answer the call and attempt to get in communication with the vessel in distress; this results in interference and confusion, and oftentimes causes delay in rendering assistance. This is of vital importance to the Coast Guard, which is charged by law with the duty of rendering assistance to vessels in distress. Should the Government have the monopoly of coastal and commercial stations, this difficulty would readily be overcome.

The Government, through the Navy Department, now operates as a military necessity a chain of radio stations along the coasts of the United States and most of its outlying possessions; commercial companies also operate radio stations. If all these existing coastal, commercial, and Government stations were placed under one management, interference—the basic argument for Govern-

ment ownership—would be reduced to a minimum, first, by discontinuing a number of unnecessary stations, and second, by enforcing the same set of rules and regulations at all stations. It is understood that the existing naval stations and personnel can take over the commercial radio business and handle it, in addition to the official business now carried on, with little if any increase in the expense of maintenance, up-keep, or operation, and that the revenue derived from commercial business, although not sufficient to make the business self-supporting, would materially reduce the operating expenses.

For the purposes of national defense, the enforcement of neutrality, and other military measures, the necessity for Government operation of radio stations is clear, but it is believed the Navy and War Departments can give more detailed views along these lines.

It is believed that the development of radiotelegraphy will not in any way be hindered by the enactment of the bill into law, but that, on the contrary, private enterprises will be stimulated to further effort in overcoming the many difficulties encountered in this means of communication. The scientists of to-day engaged in the solution of these problems are not, as a rule, connected with operating companies.

It is generally admitted by operating companies that the receipts from fees charged for shore to ship business and vice versa are far less than the operating expenses; in fact, are only nominal, and it is believed the handling by the Government of the shore end of communication between ship and shore would relieve operating companies of a burden.

The advantages of Government ownership of radio stations may be summed up as follows:

1. Advantages to the Government:

- (a) More efficient service due to the elimination of interference, and to the fact that the Government operators would be kept busy and in practice.
- (b) No confusion in taking charge of and operating all stations in time of war or when military necessity demands.

- (c) Less difficulty in enforcing neutrality in so far as it pertains to the radio.
- (d) Increase in treasury receipts.

2. Advantages to steamship lines, and other maritime interests and to the public in general, particularly large business concerns:

- (a) More efficient service due to 1 (a).

- (b) More expeditious rendering of assistance to vessels in distress.

There would be no disadvantages to the Government as to increase in operating expenses over that at present would be practically insignificant. There would be no disadvantages to maritime interests or the general public.

It is therefore recommended that section 6 be amended to read as follows:

That after three months from the passage of this act and at any time within two years after the expiration of said three months, but not longer, the Government, through the Navy Department, shall have authority to acquire by purchase at a reasonable valuation all coastal and commercial stations now in operation in the United States, Alaska, Hawaii, Porto Rico, and the Swan Islands, and no licenses shall be granted to any coastal or commercial station after two years and three months from the date of the passage of this act.

While the bill provides for the licensing of all experiment stations, technical and training school stations, and amateur stations, so far as concerns the transmitting of radio signals, where those signals can be heard beyond State limits, there appears to be no restriction or check of any kind upon stations which are maintained only for receiving radio signals. True, a penalty is provided as punishment for divulging the contents of radio messages, but within range of every coastal, commercial, or Government station there are numbers of amateur receiving stations, any one of which can readily copy radio correspondence and give it to the public or to private persons with little chance of detection. As a military measure in time of war or public peril it is believed necessary to know the location of all receiving stations, and in this connection it is understood the War Department has been embarrassed by such stations along the Mexican border and were put to considerable trouble in locating a number of them. It is therefore recommended that a new section be inserted in the bill, between sections 4 and 5 as follows:

That no receiver, other than those belonging to or operated by the United States, shall be used by any person within the jurisdiction of the United States, to receive any radiogram by means of the apparatus and methods of radio communication unless such receiver is recorded at the Department of Commerce; provided that nothing in this section shall be construed to apply

to a receiver not capable, in the judgment of the Secretary of Commerce, of receiving radiograms to or from points beyond the limits of the State in which said receiver is located. Such record shall be in such form and contain such information as the Secretary of Commerce may by regulation prescribe.

It is believed that provisions in section 12 relative to alien operators should be extended so as to prohibit the employment of alien operators on board merchant vessels of the United States, and it is therefore recommended that the words "that he is a citizen of the United States" be substituted for the words "the country of which he is a citizen," in line 5, section 12; that the words "except for the operation of a station on shipboard" be omitted in lines 15 and 16, section 12; and the following words be inserted after the word "station," in line 19, section 12, namely, "Under regulations prescribed by the Secretary of Commerce, one alien operator may be temporarily employed for service on a merchant vessel of the United States in emergency."

The need for radio legislation at this time is very urgent, and while the bill, if enacted into law as submitted, will be of benefit to the Government and to the public at large, it is earnestly recommended that the bill be strengthened along the lines herein set forth.

Respectfully,

W. G. McADOO, *Secretary.*

To expand a little bit on the letter, I would like to state that while these are the views of the Treasury Department, in view of the fact that the Coast Guard is the only bureau under the Treasury that is interested directly in radio operation and management, these views are also the personal views of the captain commandant of the Coast Guard, as well as my own. I was a representative on the committee that drew up this bill. I believe the necessity for Government ownership from a military standpoint should not be touched upon by myself, as I am not as well able to do that as representatives from the War and Navy Departments, and I will let that go by, as I believe Commander Todd has already put forth very strong arguments. The Secretary's letter is based principally on the matter of interference, and I would like to point out that at important seaports, such as New York, New Orleans, San Francisco, and other places where this interference is so great, we have great trouble in getting our messages through. Now, if all the stations at these points were under one management, the maximum amount of radio work could be put through in the minimum amount of time, and I believe there would be no trouble under such conditions in getting all the radio work through that is required. As it is now, if we send a message to one of our vessels off New York, a cutter, or the derelict destroyer *Seneca*, we never know whether the message is going to be delivered in 1 or 10 hours; whereas if we send it to a cutter off the coast of Maine through the Portland Navy station, or through a station on the Gulf, as at Pensacola, or any other radio station where there is no other station to cause interference, the message goes through in a very short time; a reasonable time. And so, clearly, the delay is due to interference. Of course it might be brought forth that the business at these other stations, such as New York, is greater; but I believe that in the case of the naval stations on the coast, and in the case of our messages particularly (as we have complete cooperation with the Navy), other business would not cause so great a delay. I think it is entirely due to interference.

The coast guard and the Navy cooperate very effectively in despatching information relative to vessels in distress. We have had in effect, and it has been for a year, a plan whereby the coast-guard stations along the coast on the receipt of news relative to a vessel in

distress send that news directly to the nearest Navy radio station. The Navy radio station, without any further orders at all, sends that news to the nearest coast-guard cutter, to the coast-guard superintendent, and coast-guard division commander, and other persons who are interested in getting aid to the vessel in distress as quickly as possible. That plan has worked admirably. It has been in effect for about a year and, as I say, it has worked admirably. In some places we have been hampered a great deal due to interference, and there are a number of cases on record where delay in rendering assistance to vessels in distress has been caused by interference; in other words, the radio stations have not been able to disseminate this information quickly. There is a provision of the London Convention which requires that shipboard stations shall send their messages to the nearest coastal station, provided, I believe, no interference is caused by sending to a more distant station. If the shipboard station uses a wave length of 1,800 meters or greater, they may send to a more distant station. Coast-guard cutters, being small vessels, can not use effectively a wave length of 1,800 meters or greater, and therefore we are more or less bound by the London Convention to send all of our official traffic to the nearest coastal station. As a result official business of the Government has to be carried on at times through commercial stations, to which a charge is attached (of course, only nominal—6 cents a word), when a naval station just a few miles more distant could be communicated with just as well without cost to the Government. It is not only the nominal charge of sending through a commercial station, but also the clerical work involved, accounting, etc., and other little matters that creep in, and also it interferes with this plan of communication now in effect. In other words, while for distress messages the London Convention could be set aside for the time being, in following out this plan of communication for other matters the Navy could not disseminate that information, because their vessel would be nearer another coastal station, probably a commercial station, and the message would have to go through that station.

The CHAIRMAN. That is the reason why you think the Government ought to control that commercial station, is it?

Lieut. WAESCHE. Yes, sir. If the Government controlled that commercial station, we would not have this interference, would not have this accounting, and would get better results, due to this close cooperation and due to their understanding our work, knowing exactly what to do with the messages when they get them, how to handle distress calls, and where our vessels are located, and all that, which would not be possible with the commercial companies. Of course, the commercial companies are also very much interested in rendering assistance to vessels in distress, and I will say they vie with one another and with the Government in doing this work. When a vessel is in distress, of course, it sends out broadcast a distress call, and experience has shown (as set forth in the Secretary's letter) that when that call is sent out all the ships and shore stations in the vicinity immediately open up and try to get into communication with the ship. They all want to be the one to render assistance. Naturally, it is a good idea, in a way, but the result is that they interfere with each other and no news gets through, and everybody has to sit down and wait until the operators get tired and come to

their senses and close up and let some one get through and get the information. As a result there is great delay. Now, if all those stations were under one management, we could have some shore station in control which could control the situation and make everybody keep out. As it is now, there is no controlling authority to say who shall do the work and who shall not do the work.

The CHAIRMAN. Who would determine what authority that should be?

Lieut. WAESCHE. If it was under one management, a shore station—of course, the shore station always has more power than the ship station, and would be in a position to know approximately where the vessel was (at least as well as anybody else) and could take charge of the situation and tell anybody else to keep out while he got the information, and then give instructions as to what should be done. As it is now, there is nobody who has any authority to tell other ships or other stations to keep out and let some one person, some one station, get the information, so that the assistance can be rendered in an expeditious manner.

Mr. EDMONDS. That would only prevent a certain percentage of interference.

Lieut. WAESCHE. It would reduce it, of course.

Mr. EDMONDS. It would reduce it, but the ships at sea would still endeavor to break in, if they could, and if the ship in danger was too far away from the shore station they would break in.

Lieut. WAESCHE. Oh, yes; they would break in, too, but it would prevent the shore stations from breaking in.

Mr. EDMONDS. It would prevent a certain number of stations from interfering; yes.

Lieut. WAESCHE. It would reduce the interference; it would not obviate it entirely.

The CHAIRMAN. It is very important to get the information to the ships as soon as possible, anyhow, to do the rescue work—

Lieut. WAESCHE. But it is not necessary for them to use their transmitters. If a vessel sends out a distress call and a vessel gets in communication with the ship sending the call, she can get in immediate communication with the shore stations; and if the ships won't use their transmitters, without any trouble, they would get all the information they needed.

The Secretary has also, in his letter, touched on the development of the art, and while I am not at all qualified to discuss that subject very comprehensively—and there are many more gentlemen here who will talk later and who will probably give better views along that line—inasmuch as it has already been touched on, I would like to expand on it a little further.

Mr. EDMONDS. Is this the Secretary himself expanding on the art?

Lieut. WAESCHE. This is the Secretary's letter I just read.

Mr. EDMONDS. You say the Secretary himself is expanding on the art?

Lieut. WAESCHE. No; I say I will expand a little bit.

Mr. EDMONDS. Oh, I thought you said the Secretary, and I was wondering if he was an expert.

Lieut. WAESCHE. No.

Mr. BOWERS. You refer to the Coast Guard. Is that a new bureau?

Lieut. WAESCHE. The Revenue-Cutter Service and the Life-Saving Service, about two years ago, were combined and made into a new service called the Coast Guard.

Mr. BOWERS. That is the old Coast Guard Service?

Lieut. WAESCHE. That is the old Life-Saving Service and Cutter Service combined.

The CHAIRMAN. How many vessels are there in that Coast Guard Service?

Lieut. WAESCHE. We have 26 what we call cruising cutters; that is, vessels that cruise the oceans and the Gulf, and I think about 30 to 35 harbor boats and launches. Those figures may not be correct; that is just approximate.

Mr. BOWERS. The revenue cutter *McCullough* is regarded as one of the larger vessels?

Lieut. WAESCHE. The revenue cutter *McCullough* is regarded as one of the larger vessels and is what we call a cruising cutter.

Mr. BOWERS. How many such vessels have you?

Lieut. WAESCHE. About 25 or 26. In view of the fact that the Navy Department is by far the principal user and buyer of radio apparatus and as a military necessity, the Navy Department must have the best apparatus that the market can supply, and as this bill proposes that the Navy Department shall take over only the operating field of radio on the shore end, leaving the entire manufacturing field undisturbed, just as it is to-day, and not interfere at all in the operating field on shipboard, which is the most extensive end of the operating field, it is not exactly understood how the development of the art will be interfered with. Also, the scientists of to-day, as I believe, are mostly with the manufacturing companies (it is natural they should be), the mere fact of the Navy operating the few coastal and commercial stations should make little or no difference in the development of the art, in view of the more extensive field on board ship for operating and the entire manufacturing field, which would be left as it is to-day. Also, in regard to patent rights, which was brought out yesterday, I believe, that tends to show, also, that the development of the art will not be retarded. Also, it must be borne in mind that the Navy Department and War Department, as well as the Bureau of Standards, have experts of no little ability themselves who have done their share in the development of the art so far. And so I would just like to state that I am not convinced in any way at all that the development of the art will be retarded, but believe it will be stimulated.

There was a new point brought forth in the Secretary's letter in regard to the recording of receiving stations. I believe that the amateurs should be interfered with but very little, and the provisions of this paragraph, I believe, will have that effect. I believe the amateurs will not object to it. It is simply a matter of having the Government know where these receiving stations are, and I believe the boys of the country who are interested in this work would be glad and proud to know that their stations were recorded with the Department of Commerce. The object of that section would only be to put an obstacle in the way of undesirable receiving stations. Of course, it will be very difficult to find a receiving station if the owner desires to conceal it. But I believe there should be

something in the law to throw an obstacle in the way, so that undesirable receiving stations would not be operating openly and aboveboard, without any restriction whatsoever.

I will stop here in favor of Capt. Bullard. In regard to the operators on shipboard, I believe Commander Todd has set forth the idea much better than I could, and I would just like to say I am heartily in accord with his views set forth along that line.

Commander Todd. Before introducing Capt. Bullard, I would like to say that in 1912 the radio act under which we are now working was passed by Congress, at the same time the Berlin convention was ratified, and a little later the London convention, which changed the situation very little from what was required by the Berlin convention. With those two coming on—the radio act and the Berlin convention (and it should be remembered there was absolutely no control of radio matters up to that time)—the Government's activities, so far as radio communication was concerned, widened immediately to a tremendous extent. Naturally the Department of Commerce and the Navy Department were most affected, the Department of Commerce because it had the administration of the act and the Navy Department because of the ownership and operation of shore stations and the tremendous number of sets on shipboard. The Navy Department, therefore, had immediately to expand, get up an organization to meet the situation; and the department, wishing to come up to the confidence that Congress expressed in passing this bill in allowing the department to handle commercial business at certain of its stations and giving it such a free hand in radio matters generally in this country, chose Capt. W. H. G. Bullard to organize the service.

In my testimony the first day I have either said very openly or very strongly that we had a certain number of stations working very efficiently and we have an organization to handle the accounts, and we are prepared in every way to expand our activities with very little increase in personnel or trouble in any way. We are prepared to do it right away. In saying that, I was referring to the work of Capt. Bullard, who organized the service, especially chosen for the task, and who carried on the work for three or four years. In the natural course of events, he of course, had to look out for his future and had to go to sea in command of a battleship last July, at which time I relieved him. So Capt. Bullard is really the one in the Navy Department who knows more of the effect of this bill and the stronger ideas contained in the Secretary of the Navy's indorsement of it, than anybody else. I will now ask Capt. Bullard to make his statement to the committee.

#### STATEMENT OF CAPT. W. H. G. BULLARD, UNITED STATES NAVY.

The CHAIRMAN. Captain, will you give the committee your full name and rank in the Navy?

Capt. BULLARD. William H. G. Bullard, captain, United States Navy, at present commanding the battleship *Arkansas*.

The CHAIRMAN. I will say that Capt. Bullard and I were colleagues in the London Conference on Safety of Life at Sea, and the acquaintance formed there has given me a very high opinion of

Capt. Bullard and I am glad to have him here this morning to give the committee his opinion on this very important bill.

Capt. BULLARD. Only yesterday was it known to me that it was possible for me to attend a hearing before this committee on the subject of this present proposed radio bill, and therefore I have not quite the complete information of what has gone before. So I would prefer, if possible, rather to put myself in the position of answering questions that might be propounded, rather than taking up any thread of the narrative and continuing it. As I say, I am not familiar with the form of procedure that has gone before and have not had time to read over the preceding minutes of the meeting.

The CHAIRMAN. I would say we think it better to let the witness complete his statement, unless some incidental matter comes up, on which a member of the committee may desire to ask some question.

Capt. BULLARD. Yes.

I could make a few preliminary remarks. I may state, at this time, this bill in its present form as presented to the committee for its consideration is the result of the deliberations of representatives of all the departments of the Government—not only the military departments but all the other departments of the Government who are far from approaching it from a military point of view, such as the Departments of Labor, Commerce, Interior, Weather Bureau—all the departments.

The need for this suggested legislation had been very strongly impressed upon me during my official assignment as superintendent of the Naval Radio Service, and I believe it was myself who was the originator of this bill, although I do not claim now at this time to be the author as it now stands. I personally drew up many features which I considered desirable to be incorporated in the bill, and, working along with my assistants, got into shape a suggested act which was proposed with the idea of increasing general Government control, with the basic principle of eliminating interference and touching also on the basic principle of general preparedness for war. That point of view I have had in mind as a military officer for years and, naturally, have been a strong Government person. This bill I took with its provisions to the head of my executive department, the Secretary of the Navy, and on his instructions I was directed to communicate with the other departments of the Government and ask them to cooperate in sending representatives to consider this suggested act which had been drawn up by myself and my assistants. That was, presumably, about 18 months ago. The other departments of the Government readily fell into the idea and each named one or more representatives of their department. I may say here that the Secretary of the Navy said to me personally—but I am not sure in writing—that he would have nothing to do with the bill, nor would he consider it in any way unless it had the full consideration—open consideration—of all the departments of the Government; that he would not at any time think of sending a bill to Congress of this nature without considering the interests of all the departments of the Government. Acting along those lines, different representatives of the departments were appointed, and we met and started to have meetings. As the Navy Department was the real instigator of this

procedure and proposition, I, as representative of the Navy Department, was made chairman of the committee and presided over this committee for more than a year. Meetings were held just as often as we could get the representatives together, and the various sections were considered and others proposed.

This went on until it became necessary for me to give up that duty, when I left in June of this year, and it was turned over to my successor, Commander Todd; since which time, I understand, the committee have continued to hold meetings during the summer, and the result of their deliberations is now in the completed act that has been presented to your committee for consideration.

I have read the bill carefully, and while I recognize that it is not the bill I and my assistants prepared, I do recognize a great many of its features and I also recognize that it has been improved in very, very many ways; but underlying it all are the basic principles which we first established, which are based, first, purely on the military necessity of being prepared for trouble. Now, we hear considerable about the proposition in regard to these commercial stations, that the Government is in a position to take them over in time of war; but it must be remembered that in times of war, however we deplore it, we do not get all the notice in the world we want; we do not get three or four weeks' notice or we do not get three or four months' notice. It comes on us overnight. And we want to be prepared, to have those stations under our control at all times, so that we will not have to wait, even overnight, to give an order to take them over. That is based on the general subject of national preparedness, and in my opinion is really the vital feature of the bill—to be at all times ready for whatever comes up before us. Of course, I may state that it is part of my education to be prepared for that state of things; and, in stating that, the members of this committee should consider the fact I am a military officer and I can only see this one thing as the result of my training. But I hope my vision is broad enough to see the other points that have been brought up by the other members of the committee, the representatives of what might be called the civilian element of the Government, and we were always patient and lenient in listening to them, with the result this bill has now been brought before you for consideration. There are stations of all kinds, all over the United States, operated by big companies, little companies, and individuals, and it would be a matter of considerable difficulty to take them over suddenly, if we wanted to, in time of war; send Government operators to them with possibly unknown apparatus and unknown localities in which to work; and it would be all confusion. And what we desire is to take them over now, so that we will always be ready. I think one of the strongest points for this so-called Government control, even Government ownership, is the fact that this proposition is quite different from the general proposition of Government ownership of other public utilities, in view of the fact the means by which communication is effected, the atmosphere, is a medium to which title can not be given by anybody or to anybody, and in that respect is quite different from any other form of communication, such as the telegraph, telephone, or cable, where distinct title can be given to the right of way and to the cables themselves, and the material features which can be turned over and deeds given

to the owners. But when we use the atmosphere this is an impossible proposition. It is free to everybody, and thus being free to everybody, it seems to me should be under the control of one management, and the only management that is in a position to control it is the Government.

The bill as drawn is quite different in many respects from the bill as I remember it when I left, and my duties at sea have been such that I have not been able to give it the consideration in its new form that I would like. But I have read it over very carefully and am quite confident that I can give it my entire personal approval and recommendation.

I may say that I have studied this subject for years. As commander Todd said, I was the first superintendent of our radio service and in that capacity acted nearly four years, during which time I had no other thoughts to think of but radio communication, and watched the effect and operation of the present law; and I am sure that anything that Congress could pass would be an improvement over present conditions, as in many cases they could not possibly be worse. I can not see that any proposition along these lines will in any way hinder this art and its development. We have not touched the amateurs in any way, shape, or form. They can go along just as they are now; and there is where the real development starts, although it seems surprising to say, but of these thousands of boys playing and fooling with this apparatus, some one or two will find something worth developing, and they do develop it and then take it to the higher scientists and get them started on it. We do not propose in any way, even if this full proposition went through in accordance with the amendment asked—to take over the high-power stations—to hinder the development of the art, but rather to encourage it.

Then the people and the engineers working along this line would know that here is the one source for their efforts where they can take and market their goods and know that they will be used, because the Government will always have use for the very, very best; and, as a matter of fact, in the Navy Department stations now, I am quite sure, we are well ahead of the art. Our needs now are greater than the present state of the art can furnish, and as a consequence every one is working toward those needs to effect the kind of communication we desire. It is the Navy Department who controls the greater number of stations along the coast and their operation, and it is the Navy Department which sends out in advance what it needs. It publishes broadcast to the engineering radio world the things that it wants, and it is that broadcasting of those needs which starts these people to work; so it hardly seems to me a fair proposition to come in here and say that this thing will stifle the art. We have not been stifling the art in the past; we have been encouraging it, and are encouraging it every day, telling them just what we need, and I am sure, from our operation and experience with it, we know what we want. We go to them and say, "Here is what we want," and they get busy on it. They furnish us with a particular kind of apparatus which will possibly do the work with a fair measure of success, and then the Navy Department turns around and tries to see if it can not get some one else to work along this same line, or to make, possibly, apparatus along the same lines, with the idea of getting

better than the other people and thereby stimulate competition all along the lines.

In many, many instances the result of that has been to get better apparatus by far than we had in the start. So we can never fall behind, and if it is all under one control—as I say, the Government only can and should be in control—all the inventors in this art of radio and all the engineers working at it will know that there is one central office where they can go with their ideas and have encouragement, and where they will feel they can be assured of encouragement.

We have now a provision of law for building a new laboratory under the Bureau of Standards, in which the three departments—the War Department, the Navy Department, and the Department of Commerce—are actively engaged in this research work. We put our own research people upo against the outside research people, and it is in that way we hope to gain keen competition; and I feel perfectly confident that in putting this bill into effect it will have the very opposite effect of stifling competition or efforts in the radio world and will certainly increase it.

The CHAIRMAN. Who is the largest purchaser of radio apparatus, the largest user of it—anyone other than the Government?

Capt. BULLARD. From my own point of view and my state of information I say the Navy Department is by far the biggest purchaser of all the apparatus used in the United States, except, possibly, certain large steamship lines, which are required by law to fit their ships with apparatus; but that apparatus is very small, of low power, and has long since been standardized, and there is very little development along the line of ship installation, or very little need for development, except possibly of the receiving line. Outside of that it is the Navy Department and their big stations on shore, as well as their big stations on board ship, which must be provided for battle purposes, which is the biggest purchaser of apparatus, as far as I know, in this country. The manufacturers and all look to the Navy Department as their best, certainly their largest, customer, and it is the Navy Department they try to please.

Mr. EDMONDS. You mean their largest customer—not their best?

Capt. BULLARD. As their largest customer. "Best" possibly is not quite right.

Mr. EDMONDS. Have you any idea what nations control their coastal stations?

Capt. BULLARD. I can not say right offhand, but my impression now and best recollection is—well, the best answer I can give to that is to say that nearly all of them operate their coastal stations. I do not remember any that do not.

Mr. EDMONDS. They do not control inland stations, do they, but just the coastal stations, as proposed in this bill?

Capt. BULLARD. As to inland stations, I am not prepared to give the information, because I do not know; but, through some department or other of the Government—it is some department of the Government that controls it—they are all coming to it fast. Even Great Britain, France, and Germany, of course, and their colonies, which is the biggest portion of Europe.

Mr. EDMONDS. England handles the wireless through its post-office department?

Capt. BULLARD. Through its post-office department; yes.

Mr. EDMONDS. The same as their telegraph?

Capt. BULLARD. Except in war time.

Mr. EDMONDS. Of course, that would be a very unusual condition.

Capt. BULLARD. During this present war the English Admiralty have taken over all wireless stations.

Mr. EDMONDS. Of course, that would be a very unusual condition. I am talking about ordinary times.

Capt. BULLARD. They control it through their post office, the same as they control the telegraph and telephone business, as a medium of communication.

The CHAIRMAN. You investigated the radio service abroad, did you not?

Capt. BULLARD. Yes, sir; I have investigated thoroughly abroad, both by written reports and my personal tours through Europe for that purpose, their high-powered stations, and all are operated by the Government, or, apparently, not directly by the Government, but by Government help to such an extent that the Government controls the operation. It may be private capital that builds them, but they are controlled by the Government, and when it comes down to the last word it means Government ownership. They try and try to explain that that is not the case, but, as a matter of fact, it is the case.

The CHAIRMAN. Aside from the question of whether or not the Government should own the high-power stations on the mainland, what is your view of the Government owning and controlling the radio plants on the island of Porto Rico, the Panama Canal Zone, the Hawaiian Islands, and our insular possessions?

Capt. BULLARD. I think that is absolutely a military necessity, that we control them in those cases, in those positions and localities, and allow nobody else there. They are small islands, most of them, small places, covering small areas, and, as a matter of fact, there is no space for other than Government stations. The Government stations can do the work, and there is no place for other stations; they are not big enough for them to operate.

The present law covers a prohibition against most places, but this act goes further and includes other places, which is most desirable. During my term of administration of the service, we had several communications and requests for permission, coming from different commercial companies, to build commercial stations on the Philippine Islands and also on the Canal Zone. It seems to me that would be the end of all national defense in those places if we allowed big commercial stations to go right up in small places like the Canal Zone, where we have one of the most magnificent stations in the world at Darien, right in the middle of the Canal Zone; and on each end of the Zone we have two very fine stations for ship-to-shore work, which do all the work for all ships passing through the Canal; and are prepared to build others there when commercial necessities demand. And the same way in the Philippines. It was only through the active cooperation of other bureaus and executive departments concerned, particularly the War and Navy Departments, in bringing pressure to bear upon the Philippine government which prevented the erection of two high-powered stations, belonging to

two different companies in the Philippine Islands. This act proposes to make definite a prohibition of that proposition except with the approval of the Philippine government.

The CHAIRMAN. I have received two or three letters from representatives of the amateurs, and they are under the impression that this bill places further restrictions on them than the restrictions now imposed under existing law. If that is true, what are the additional restrictions?

Capt. BULLARD. I think they are quite mistaken. I think this bill does not in any way interfere with their activities or their stations. The only thing I can see which does is the amendment read by Lieut. Waesche, and that proposition was considered by our committee. The military representatives on that committee wished to go further than this amendment submitted by the Treasury Department; they wished to make all those amateur stations have a license; but after considering all angles of that proposition it was determined in no way to disturb the status of the amateur, and to let him go along in the even tenor of his way. But I really believe this amendment submitted by Lieut. Waesche of the Treasury Department is a very good thing, and will simply record where those people are. If a boy has a wireless station, it seems to me it would make him feel proud to know that his station was recorded in some book, file, or correspondence; that at such and such an address he has a little wireless station. That is all that amendment means—that the stations would be recorded—so that the Government would know where, in time of trouble, to make an investigation of those stations. Suppose the stations in the city of Washington were recorded in that way; in a little while an inspector, or one or two inspectors, could go over this whole city and take a look at that little apparatus and say whether or not they were conforming to the law; and I tell you that these boys would feel a little pride in having some one come to them and say "I am a Government inspector. I want to see your wireless station."

They would immediately take him in and show him their station, and the inspector could determine very promptly whether or not the boy was conforming to the law, and the boy is perfectly happy so long as you let him alone and do not do anything to him. If you let them go along they can receive messages from any place. All these little wireless stations around Washington receive messages sent out from Arlington, receive messages going to Berlin, and they could have received the last peace note, if it had gone that way, if they wanted to—nearly all of them. One long note did come from Berlin by wireless, before they began sending them by cable, during my administration, and I know of at least six amateurs in the city of Washington who received that note. It was not a peace note, but an administration note of very great importance. What is there to have prevented any of those six amateurs, if they wanted, from spreading this news all over that the Government does not want to get out?

Of course, you may say that even the recording of these stations would not prevent their doing that, except that the provisions of this act, if they were ever found out, would subject them to a very heavy fine and the confiscation of their property, and that always, of course,

is held up to them; but of course there could be stations that could not be recorded. Even if we made them record their stations people could have stations, and if they did not want to record them they would not have to, and we would have a terrible time to find them—those stations with the little amateur receiving sets, which we do not know anything about, do not know where they are. At the time this war started, when we were putting in our neutrality regulations, we had to send people all over the United States. First one started in Washington, next in Los Angeles, next in Maine, and next in Florida; there were the four corners of the United States where we had to send inspectors to hunt up the so-called suspicious stations. They can exist always; there is no provision of law to stop them; but if we could hold up to them and let them know that if they did receive messages and did divulge them they would be severely punished it might act as a deterrent to their doing so. Those stations are all over the United States, existing in the most remote places. People have in their houses little sets of apparatus—poor sets, most of them—but some of them very elaborate. The jewelers have them for getting the time.

Arlington sends out the time from here as far west as Denver, and all those jewelers have to do is to take down their receiving sets and listen to the time signals and set their chronometers by them. Those are all very proper uses. All they would have to do would be to have their names recorded in the Department of Commerce, that they have a set by which to get the time. Also, in the summertime, when the baseball games are going on all over the world, Arlington, I understand, sends out the baseball scores, and they go down to the post offices at all the four corners of the United States and receive the baseball scores. That is a proper use. Those people could not object to having their names recorded simply so that we would know where to find them, and go and look at them now and then; in case of trouble, for instance, a policeman would know every station on his beat, and, if we wanted to, could make a rapid examination of the stations here in Washington. All that would be necessary would be to send to police headquarters for those people who go out on their different beats.

That is not going as far as making them have a license.

The CHAIRMAN. It does not involve any expense to the amateur to do that?

Capt. BULLARD. Absolutely none.

Mr. EDMONDS. If you took possession of the coastal business, the ship-to-shore business, would you not find there was interference from these high-power plants that were doing an overseas business?

Capt. BULLARD. I think not. That could be arranged, on account of the great distance, by the wave lengths. A low wave length could be used by the coastal stations and a high wave length could be used by the high-power stations.

Mr. EDMONDS. Would not the next thing be that you would come in for authority to take possession of all the high-power stations?

Capt. BULLARD. I believe so eventually; yes. It is all tending to that, in my opinion.

Mr. EDMONDS. In other words, it virtually tends to Government monopoly and the elimination of commercial wireless absolutely?

Capt. BULLARD. Absolute Government monopoly for all purposes; yes.

Mr. EDMONDS. And that would be the next thing we would have to do, if we passed this bill?

Capt. BULLARD. In five or six years from now we would probably be coming back to you again and asking you to extend our control unless in the meantime the art has so advanced that proper means of communication could be kept up absolutely without interference.

Mr. EDMONDS. "Leakage" is the popular term in Congress now.

Mr. SAUNDERS. In this bill before us now there is no Government ownership to that, is there?

Capt. BULLARD. Only to the extent that it is not based on that, although it tends to it, sir. The proposition, as it stands at present, is that the Government stations shall be open to commercial business, which means the Government stations will then be legally and lawfully competing with the present commercial stations. Now, they can go along and operate just as long as they please, as long as no interference takes place; but from my experience they would in a very short time come to the Government and ask them to take those stations off their hands, because it is certainly a well-known matter that their coastal stations are kept up and operated at a loss simply because they are necessary parts in their chain of transmission. It is one of the arguments of these companies that put up coastal stations, that when they furnish ships with apparatus they inform them, "Here is your means of getting messages to the shore—through our coastal stations"; whereas if they had other means of getting to the shore, through the Government stations, they would not have to use that argument.

Mr. SAUNDERS. The theory of the bill is not to forcibly or by any manner of compulsory process take over the wireless.

Capt. BULLARD. Not at all; no, sir.

Mr. SAUNDERS. But it creates conditions under which private operators in course of time will have to give up operations.

Capt. BULLARD. Will have to give up; I should think so; yes, sir. If it had this provision as proposed by this bill approved by Congress, it could then cut the rates so much under the commercial companies that no one would use the commercial companies. There is a proposition to be considered.

Mr. GREENE. The only point, then, I can see about that is that you would practically ruin their business.

Capt. BULLARD. Ruin their business; and that is the reason that is put in there to buy their stations at a fair valuation.

Mr. GREENE. Who is going to make it fair?

Capt. BULLARD. Some commission or somebody that would be appointed by Congress.

Mr. EDMONDS. It would not have any value after it was ruined.

Capt. BULLARD. Of course not.

Mr. BOWERS. The idea is to make the purchase now, because it can be done more cheaply now than later on.

Capt. BULLARD. Than later on; yes.

Mr. BOWERS. I think, if I remember the figures, that one of the experts said that they could be purchased now for about \$400,000, whereas later on they would cost \$4,000,000.

Capt. BULLARD. When we were estimating, we estimated at first on \$250,000, and then added \$150,000 to that for good measure, and said \$400,000 for the stations we then had in mind of taking over.

Mr. BYRNES. That is the coastal stations?

Capt. BULLARD. That is the coastal stations; yes, sir. Of course, when you get into the high-powered stations, that is a different proposition. Then, instead of running into the thousands of dollars, it runs into the millions of dollars.

Mr. BOWERS. Knowing in advance that there was a probability of purchase later on, would there not be a great many people going into the radio business at the present time with the idea of selling out at a profit to the Government at some time in the future?

Capt. BULLARD. There is no reason why they could not, if they wanted to, now. They do not do it because it is a losing proposition. Anyone can go into the radio business now who chooses; but because of the experience of those who have done it, they know it is not profitable.

Mr. BOWERS. But the Government is usually compelled to pay a little more than anyone else when making purchases of this character.

Capt. BULLARD. It might be desirable to buy a radio site, build a station and put up a lot of junk there, and when the Government comes along, sell to the Government. Such an underhand proposition as that might suggest itself to some of them.

Mr. SAUNDERS. As I understand, the situation created by this bill is this, that if we give them the power to operate the Government stations for commercial business, they can then go ahead, because they have a right to do it, and deliberately operate those stations at such a loss as to drive out all commercial competition and in that way compel the commercial stations, as it were, to fall into the Government's hands and thereby practically drive them out of business. That is a possible power that the Government would have under this bill?

Capt. BULLARD. Yes. In mentioning that question of rates, of course, that is not a conceivable proposition that the Government would, I imagine, deliberately go in there and lower the rates for that purpose. The rates as established now for the Government stations and the commercial stations are absolutely the same, so that there is no distinction made.

Mr. SAUNDERS. I am speaking of it as to the power, as to the possibility of the thing.

Capt. BULLARD. Of course Congress always has the power to fix rates.

Mr. EDMONDS. Is that done by an understanding between the Government and the companies?

Capt. BULLARD. Yes; through an understanding of the Government and the companies. That is done for the reason, in the first place, if the Government rates were any higher it would not be any accommodation to the public, and if they were any lower there would be competition, neither of which is desirable.

Mr. EDMONDS. It sounds like it might be an illegal combination in restraint of trade.

Capt. BULLARD. We have no written agreement or anything else; they made their rates first, and the Government simply established its rates to conform to them, without stating any reason.

Mr. EDMONDS. Just a gentleman's agreement.

Capt. BULLARD. Yes.

Mr. SAUNDERS. Under one section the Government is given the right to purchase if the companies choose to sell. That, however, is not a right to condemn or take over at an enforced valuation; they can only buy if the other man wants to sell.

Capt. BULLARD. If the other chooses to sell.

Mr. SAUNDERS. They can not compel the other man to sell.

Capt. BULLARD. Absolutely not; no, sir. They could hold on until judgment day if they want to.

Mr. SAUNDERS. Under the present bill?

Capt. BULLARD. Yes.

Mr. EDMONDS. Are the present private plants so located that they would be of use to the Government?

Capt. BULLARD. In some cases. I imagine if this present bill passes it would be very desirable to redistribute the whole coast, taking up certain stations and eliminating many other stations. There are many stations which, in my opinion, could be absolutely abolished, wiped off, and removed because they would be absolutely useless and in a bad location.

Mr. EDMONDS. If we should put in this act a provision for the Government to appoint a commission to value these plants and purchase them or agree upon a price for these plants to be purchased by the Government, would that be an advantageous proposition to the Government?

Capt. BULLARD. I think it would help out; it would put everybody on a fair basis and everyone would know just how this value was going to be arrived at.

Mr. EDMONDS. Did your committee consider that proposition when you were going over the bill?

Capt. BULLARD. In an informal way we talked many times about how this could be arrived at. I think it was the consensus of opinion that Congress should appoint a commission to determine, or possibly do it according to the laws of each State, by condemnation proceedings instituted under the laws of each State.

The CHAIRMAN. Under existing law the naval stations can only give a limited commercial service.

Capt. BULLARD. Certain of them can not give any commercial service.

The CHAIRMAN. If we did nothing more than to remove that limitation and permitted all naval stations to do a commercial business at the present rates—if it is true, as you say, that the commercial stations are not operating at a profit now—as a business proposition they would be quite willing for the Government to take over their plants if the Government would take them over at a fair price?

Capt. BULLARD. It looks so; yes. That is the basic principle of this bill.

The CHAIRMAN. That does not involve any conceivable policy on the part of the Government to use the rate-making power to freeze them out.

Capt. BULLARD. Oh, no; no, sir. I did not intend, as I said, to convey the idea that that proposition would come up.

Mr. SAUNDERS. I suppose the question of the chairman is based upon the question I asked. I did not say anything about whether

it is the Government's design to do this, but whether as a result of the power given by this bill the Government could not do it if it chose.

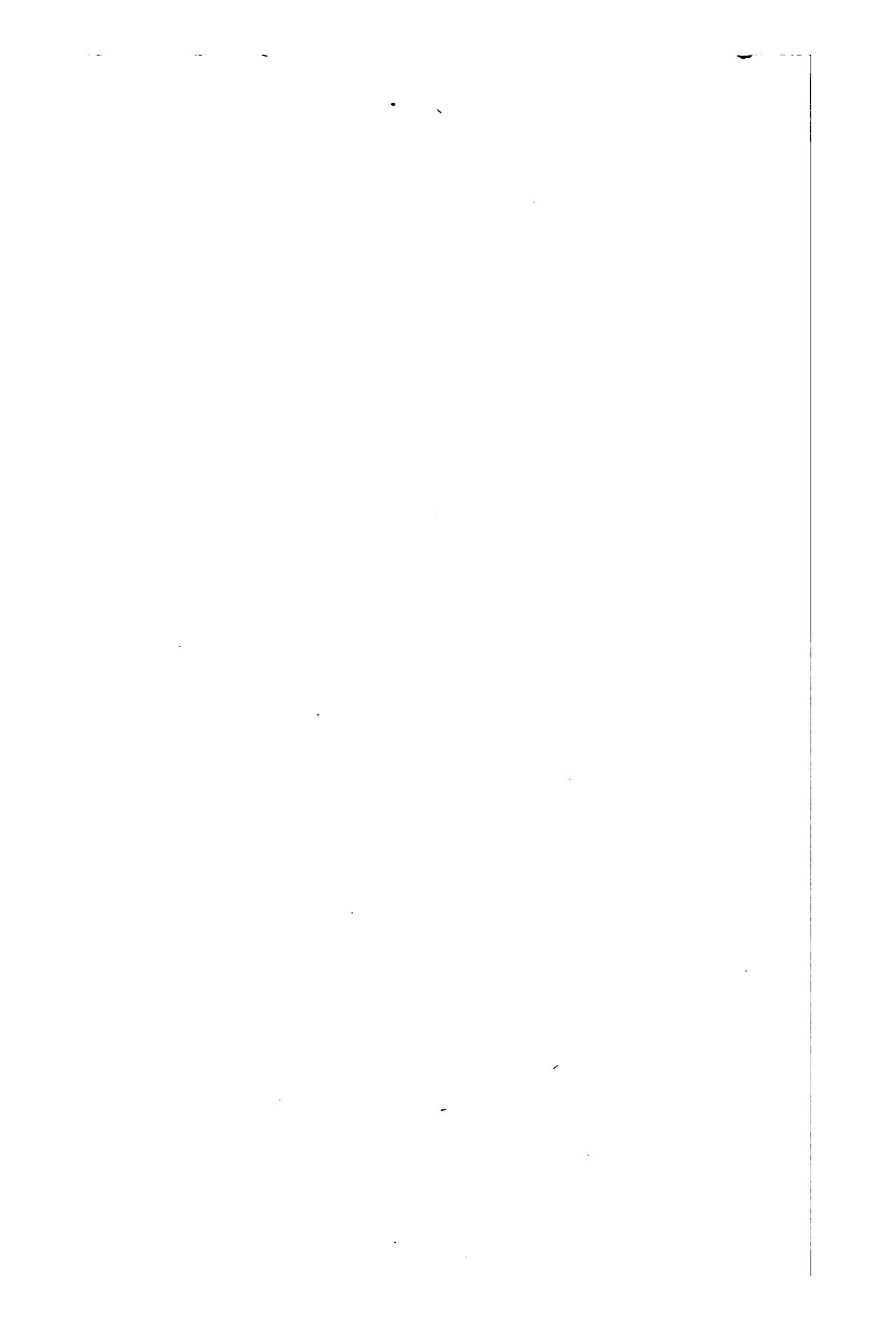
Capt. BULLARD. I think so: I think it could if it chose to do it.

Mr. SAUNDERS. That, I think, is agreed to.

Capt. BULLARD. Yes.

The CHAIRMAN. I think everybody agrees about that.

(Thereupon, at 11.30 o'clock a. m., the committee adjourned until Monday, January 15, 1917, at 10.30 o'clock a. m.)



# RADIO COMMUNICATION

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## HEARINGS

U.S. CONGRESS  
BEFORE  
THE COMMITTEE ON THE  
MERCHANT MARINE AND FISHERIES

HOUSE OF REPRESENTATIVES  
SIXTY-FOURTH CONGRESS  
SECOND SESSION

ON

**H. R. 19350**

A BILL TO REGULATE RADIO COMMUNICATION

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## PART 2

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JANUARY 15, 16, AND 17, 1917



1917

WASHINGTON  
GOVERNMENT PRINTING OFFICE  
1917

COMMITTEE ON THE MERCHANT MARINE AND FISHERIES.

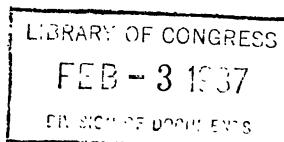
HOUSE OF REPRESENTATIVES.

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MICHAEL E. BURKE, Wisconsin.	DAVID H. KINCHELOE, Kentucky.
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CARL C. VAN DYKE, Minnesota.	STANLEY BENEDICT, California.

J. C. BAY, *Clerk.*

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## RADIO COMMUNICATION.

HOUSE OF REPRESENTATIVES,  
COMMITTEE ON THE MERCHANT MARINE AND FISHERIES,  
Washington, D. C., January 15, 1917.

The committee reconvened at 10.30 o'clock a. m., Hon. Joshua W. Alexander (chairman) presiding.

The CHAIRMAN. Whom will you have heard first, Commander Todd?

Commander Todd. Prof. Marvin, Chief of the Weather Bureau.

### STATEMENT OF PROF. CHARLES F. MARVIN, CHIEF OF THE WEATHER BUREAU, DEPARTMENT OF AGRICULTURE.

The CHAIRMAN. Give the stenographer your name and official position.

Mr. MARVIN. Charles F. Marvin, Chief of the Weather Bureau, and a representative of the Department of Agriculture on the inter-departmental board for radio communication. I have not been able to attend the hearings of the committee, and I presume many things I may say will more or less duplicate what has already been said. But it seems proper for me to indicate briefly the relations of the Weather Bureau, and, through the Weather Bureau the Department of Agriculture, to this subject. You all understand something of the activities of the Weather Bureau. The possibilities of those activities are greatly increased by radio communication especially from ship to shore. We are in cooperative relations with the Navy, and we engage the masters of many of the merchant vessels plying the coastal waters, especially of the South Atlantic and Gulf regions, to report their observations of the weather conditions in the mornings and on other occasions, through radio agencies, to the Weather Bureau. From those reports we are able to learn of conditions at sea that could not be secured otherwise. A knowledge of those conditions often enables us to issue information of great value to shipping and commerce. This is especially true during the summer season and for the region of the Caribbean Sea and the Gulf of Mexico. We also have reports from the ocean and coastal waters of the North Pacific and throughout Alaska that are communicated to us through radio agencies. Before the European war we received a number of reports from Siberia and the Far East, but those reports were cut off at the beginning of the war.

Radio communication enables the Weather Bureau to conduct its work in a way which is very important, and therefore we are greatly interested in the fullest possible development of this means of communication.

The general provisions of this bill, as I understand, have been set before you very thoroughly. If I may briefly comment on some points which impress me, I may say, in a general way, that as a member of the interdepartmental committee I have been strongly in favor of the bill in its present form and personally favored much stronger Government control. In regard to the matter of amateurs, about which some seem to be concerned, I feel that no provision of this bill restricts their activities any more than has previously been the case. There is no conscious intent, so far as I know, on the part of any member of the interdepartmental committee to interfere in any way with amateur work. I have an impression that amateurs might be made useful to the Government and to the radio interests in somewhat the same way that the Weather Bureau utilizes the interest of the public in making meteorological observations. There is a great corps of what we call cooperative observers who, out of their interest in meteorology, like to observe and record weather conditions. We encourage that interest and list them in a corps of cooperative observation. They make regular observations of the weather conditions for us in nearly all parts of the country. I see no reason why amateurs might not be enlisted as a corps of cooperative radio operators that at some time might be useful to the Government. The suggestion of listing and recording amateur stations has been made, I believe, and seems to me to be a good thing. You will have their names so that they can be made available on some occasions if need arises.

In regard to Government stations, it seems to me that we can not imagine the Government without some strong command of coastal communication through this new agency of wireless. It seems to me to be a matter of national self-preservation that the Government should have constantly at its command this means of communication along the coast. If it is conceded that such a Government agency of communication should exist, it follows as a necessary corollary that the opportunity to engage in communication and keep the system and the personnel in complete training and in high efficiency must be allowed. That being the case, it seems to me that logically all Government stations must be allowed to transact commercial business. If the stations exist, with no opportunity to engage in commercial business they will never develop to the full measure of efficiency and utility necessary in time of need. In the deliberations of our committee it was found impossible to escape the necessity that Government stations must exist and must be permitted to transact commercial business.

These considerations bring up the question of interference and competition between Government and commercial stations that may be located in the same vicinity. After prolonged study of all of the questions growing out of these matters the committee felt the only recourse was the provision of section 6, which enables the Government to acquire control or possession of the commercial stations that might be willing to sell out. There was no intention in that to drive them out of the business at all, but it was an inevitable situation that the two competing organizations could not exist side by side profitably; and it was only a proper and right view of the situation to offer to buy the commercial stations at a fair valuation.

Of course, that procedure is necessary because of interference as it now exists. We do not know but what some future development of the art may eliminate interference, and if that should come about the present situation would not exist; and this conflict and competition where stations are located side by side would be eliminated if there was some way of eliminating interference. Such a remedy may be discovered in the future and will no doubt be taken care of at the time. As long as interference exists as at present, however, a proper distribution of the stations along the coast will improve conditions. One organization could probably conduct more business by a proper distribution of stations and the elimination of avoidable interference than could be performed by a number of competing organizations trying to work in spite of each other in the same region.

The CHAIRMAN. If you eliminate the unnecessary stations, in other words, at points where there are three or four stations now and all engaged in the same business, the tendency would be to diminish the cost of the service, would it not, and make the installations on ship-board more efficient? In other words, they would be used oftener by those on board ship for communication with the shore, whereas the cost of the service now is high and very few avail themselves of that privilege. Is not that true?

Mr. MARVIN. I think so. The elimination of unnecessary stations would, of course, be accomplished through this Government control of the location of stations on the coast. As matters now stand, there are certain stations that are unnecessary, but it would be very difficult, under existing law or any provision I can think of, to eliminate stations that are now interfering with each other except by voluntary or compulsory sale.

The CHAIRMAN. Even if we were to eliminate the matter of governmental ownership, if they were commercial stations it would be far better that the license to erect a station and operate it should be under Government control so as to prevent duplication and decrease the cause of interference as well?

Mr. MARVIN. Yes, sir; but that would hardly provide, it seems to me, for the necessity for military purposes—

The CHAIRMAN. Oh, no; but I say, if you just lose sight of that, even from the commercial standpoint just to let everybody go in who wants to and put up a station and compete with the other fellow for business and unnecessarily increase the cost of installations and intensify the interference and, as a necessary result, increase the cost of radio telegrams, it would be a bad policy in any event?

Mr. MARVIN. Yes; undoubtedly.

The CHAIRMAN. And yet there is no law now to regulate it?

Mr. MARVIN. No. Certainly it would only make matters worse. In our Weather Bureau work which I mentioned awhile ago, we experience the ill effects of interference in the transmission of weather reports. There was a case reported a short time ago of a vessel trying to communicate its report to a Government coastal station, but could not do so on account of interference with one of the commercial stations operating at the same time. The commercial station was requested to desist, but declined to do so. These weather reports are made up at a certain hour in the morning and have to be forwarded at once. If they are received in time, we utilize them, but if they

are delayed in transmission our forecasts and warnings are issued without the information contained in those messages. And when those cases occur, we do not know what the conditions at sea may be, and very great importance attaches to some of these reports. Naval vessels plying the coast, or merchant vessels, may know of conditions off the coast of which we have no knowledge, and the report from them, in conjunction with reports from our land stations, gives us an idea of meteorological conditions that may enable us to send warnings of immense value to the shipping along the coast; whereas failure of a report of that kind to come through means a serious loss to the interests.

Interference due to too many stations, certainly should not be permitted, and competition should not be permitted to cause failures and delays in the transmission of important messages like weather reports. We want to eliminate that possibility as much as possible by the prevention of the multiplicity of stations and by the distribution of necessary stations in the most advantageous manner.

Some comments have been made in regard to stifling the art; that Government control operates to stifle the art. It seems to me that is a bugaboo; I do not believe you can stifle art in that way. I happen to be a member of the National Advisory Committee on Aeronautics. We have had brought to our attention certain matters of which I am not at liberty to speak in detail but which indicate that the exercise of private monopoly operates to stifle the art and retard the development of important inventions to a far greater degree than would result from Government control of the same matters or of inventions of any kind. I can not be in accord with those who claim that mere Government control and supervision of an activity of this kind is going to stifle the art. Private monopoly may control a situation and be unable or unwilling to develop an invention or an industry themselves and so terrorize—the word “terrorize” is too strong there, perhaps—or hold such a menace in the way of royalties, etc., over other commercial industries wishing to enter the given field of invention and manufacture as to stifle the art far worse than any kind of Government control of wireless or any other invention would exercise. Too much weight must not be placed on the assertion that strong governmental control of a great agency of this sort, which is necessary for the welfare and security of the Nation, is going to stifle the development of the art.

In regard to high-power stations, we feel that that matter, as provided for in the bill, is about the best the committee could do at the time. Personally, I am opposed to allowing the existence of stations that in any sense or under any possible circumstance may become a menace to the National interests in any way. The question of ownership of these stations and all that, is covered in the bill very well and it seems to me the instinct of self-preservation justifies the Government in exercising such a control over stations of this character as will completely prevent their use prejudicially to the interests of the United States at any possible future time.

The Weather Bureau is in cordial cooperative relations with some of the commercial companies operating high-power stations, and I see no reason why such stations may not be organized on some basis of cooperative relations with the Government that would make them

a part of our organization and not permit, possibly, under some exigency that might arise in the future, of an independent use of such stations inimical to the interests of the Nation.

I do not know that I can go into the subject in further detail with any advantage. I have attempted to express the ideas and opinions that guided me in my part in the preparation of the bill. I should be very glad to answer any questions.

The CHAIRMAN. Of course we have insular possessions like Porto Rico and the Hawaiian Islands, and they are regarded as outposts, and we are expending large sums of money on the Hawaiian Islands, for instance, in coast defenses, and the development of the wireless, with a view of making them powerful naval stations. How does it strike you; is it consistent with the purpose for which we are building and maintaining a Navy and developing those stations as great naval bases, to permit commercial companies to maintain even high-powered stations there, or should not that service all be under the absolute control of the Government?

Mr. MARVIN. I favor Government control very strongly and very broadly, Mr. Chairman; but, at the same time, I do not wish to be understood as antagonistic to friendly commercial activity where the two can be carried on side by side. I think this instinct of self-preservation justifies the strictest possible Government control of this situation. If private interests can operate as a part of the system so as to be a real working part of the Federal control, I think private stations would be justified. But where such requirement can not be satisfied, then I think Government control should dominate.

The CHAIRMAN. Don't you think Government control should be enforced in any event; that is, the Government should have the power at any time to take over these stations and control them and regulate them?

Mr. MARVIN. Yes, sir; decidedly so. This bill practically does that much.

The CHAIRMAN. Whether the Government condemns them and takes them over and monopolizes the entire field or not.

Mr. MARVIN. I think that should be so. The serious question is, if they are left as commercial activities, possibly under a foreign control for a time, they may do great injury before Government seizure is exercised, in case of exigency. And therefore the previous complete control and regulation of those things by the Government would be justified I feel. I can imagine, however, that possibly the commercial interests properly conducted might cooperate with the Government.

The CHAIRMAN. Oh, yes.

Mr. MARVIN. To such an extent that absolute out-and-out complete ownership at the present time may be unnecessary.

The CHAIRMAN. No doubt that is true; but the power ought to exist.

Mr. MARVIN. The power should reside with the Government, I think.

The CHAIRMAN. If there are no other questions of Prof. Marvin, who will you have next, Commander Todd?

Commander Todd. I would like the committee to hear next Mr. Denning, of the Post Office Department. If I may say a few words of introduction, the representatives of the Post Office Department on our committee were the First Assistant Postmaster General, Mr. Koons, and the postmaster of the city of Washington, Mr. Chance. On account of pressure of official duties and their lack of specific interest in the details of the bill, they attended very few sessions. Mr. Denning, chief clerk of the Post Office Department, has been designated to speak for that department.

**STATEMENT OF MR. WILLIAM I. DENNING, CHIEF CLERK UNITED STATES POST OFFICE DEPARTMENT.**

Mr. DENNING. Mr. Chairman and gentlemen of the committee, while the Post Office Department had little active representation on the committee in the preparation of the bill, we are very much interested in its passage. It is somewhat analogous. The position of the Post Office Department in regard to this bill is somewhat analogous to its position with reference to Government control of the telegraph and telephone facilities. It has been charged that in the advocacy of Government ownership of the telegraph system the various Postmasters General have been actuated from political considerations. In that connection I would like to call attention to the fact that it was the Government that first gave a practical demonstration of the telegraph in 1843. There was an appropriation of Congress of \$30,000 for this test, but the telegraph soon passed out of the hands of the Government into the hands of private monopoly. And practically every Postmaster General from that time to the present day has recommended Government control of telegraph lines.

The CHAIRMAN. My attention was diverted for a moment, and I did not get that date. From what time, did you say?

Mr. DENNING. In 1843 the practicability of the electric telegraph was first demonstrated under Government control or Government ownership.

Mr. GREENE. Did I understand you correctly as saying that all Postmasters General from that time have been committed to the proposition of Government control?

Mr. DENNING. No; I say practically all.

Mr. GREENE. What do you mean by "practically all"?

Mr. DENNING. Possibly there have been four or five exceptions. The exceptions were in cases where some Postmaster General held office only a short time; that is, were in office only for a year or two. I do not recall just which ones who held the office for four years did not recommend it, but there were one or two, I think.

Mr. GREENE. Do you recollect any who did?

Mr. DENNING. Who did recommend it?

Mr. GREENE. Yes.

Mr. DENNING. Yes; Postmasters General Howe, Creswell, Wana- maker, Hitchcock, and Burleson. Those are the ones I can recall.

Mr. GREENE. Oh, we can all recall that Postmaster General Burleson is in favor of it, without doubt.

The CHAIRMAN. I can recall very readily Postmaster General Hitchcock, too.

Mr. DENNING. I can put in the record, if you wish, a complete list.

Mr. GREENE. I wish you would do that.

The CHAIRMAN. Yes; I would like to have that go in the record.

Mr. DENNING. We have very complete information on that subject.

The CHAIRMAN. The only three I remember are Wanamaker, Hitchcock, and Burleson, of course.

Mr. DENNING. Postmasters General Howe and Creswell I know of. I can remember those, and I know there were others.

The CHAIRMAN. How long have you been in the service yourself?

Mr. DENNING. I have been in the Postal Service since 1903, and have served in several of its branches. The strategical advantages, from the military standpoint, of Government control of the radio have been well covered, and it is not necessary for the department to go into that feature of it. There is one feature, however, which we deem it our duty to call to the attention of the committee, and that is the provision authorizing the Secretary of Commerce to fix rates and license stations. This seems to us somewhat an inconsistency. The Post Office Department now fixes the rates for telegraph messages sent by the Government on official business handled by companies who have filed their acceptances of the provisions of the act of 1866. There are three wireless companies, also, who have filed acceptances, and rates have been fixed by the Postmaster General.

The CHAIRMAN. In connection with your hearing here, will you incorporate in the record those provisions in the act of 1866? (See pp. 96-97.)

Mr. DENNING. I will, sir. And I want to read, with the permission of the committee, a copy of the letter addressed to the chairman of the committee by the Postmaster General on that subject:

The Postmasters General of the United States who have advocated Government ownership of the telegraph systems of the country are as follows:

Postmaster General Johnson, annual reports of 1845 and 1846.

Postmaster General Randall, annual report of 1867.

Postmaster General Creswell, annual reports of 1869, 1871, 1872, and 1873.

Postmaster General Maynard, annual report of 1880.

Postmaster General Howe, annual report of 1882.

Postmaster General Gresham, annual report of 1883.

Postmaster General Wanamaker, annual reports of 1889, 1890, 1891, and 1892.

Postmaster General Hitchcock, annual report of 1911.

Postmaster General Burleson, annual reports of 1913, 1914, 1915, and 1916; also advocated Government ownership of the telephone systems of the country.

The Presidents of the United States who have advocated Government ownership of the telegraph systems of the country are as follows:

President Grant, message to Congress, 1871.

The CHAIRMAN. I would suggest that I have those letters, and as we only have a few members of the committee present this morning I think it would be better to await a full meeting of the committee to read those letters.

Mr. DENNING. Very well, sir.

The CHAIRMAN. You may incorporate it with your remarks, but we will read all of the letters from the heads of the executive departments when the members of the committee are all present, or nearly so.

(The letter of the Postmaster General is as follows:)

JANUARY 5, 1917.

Hon. J. W. ALEXANDER,  
*Chairman Committee on the Merchant Marine and Fisheries,  
 House of Representatives.*

DEAR MR. ALEXANDER: Your letter of the 23d ultimo, transmitting copy of bill H. R. 19350, an act to regulate radio communication, has been received.

It appears from such examination as could be made within a limited time that the general object and purpose of the bill are very meritorious. However, I wish to urge my objection to the provisions of the bill which would give to the Department of Commerce instead of to the Post Office Department jurisdiction over the licensing of commercial stations, the fixing of rates on commercial business, and the promulgation of regulations and their enforcement. In this connection I beg to recommend that the words "Postmaster General" be inserted wherever the words "Secretary of Commerce" appear and that the words "Post Office Department" be substituted for "Department of Commerce" wherever the latter term appears. As bearing upon this matter, attention is invited to the act of Congress approved July 24, 1886, an act to aid in the construction of telegraph lines and to secure to the Government the use of same for postal, military, and other purposes, which provides that telegraph communications between the several departments of the Government of the United States and their officers and agents in their transmission over the lines of any telegraph companies that have accepted the benefits under that act shall be set at rates to be annually fixed by the Postmaster General.

A study of the constitutional purposes of the postal establishment leads to the conviction that the Post Office Department should have control over all means of the communication of intelligence. The first telegraph line in this country was maintained and operated as a part of the Postal Service, and it is to be regretted that Congress on March 4, 1847, saw fit to relinquish this facility to private enterprise. Several Postmasters General have advocated the acquisition of the telegraphs and telephones and their operation by the Government. I have advocated in all my annual reports the Government ownership of these means of electrical communication, and in March, 1914, the Secretary of War recommended the transfer of the Alaskan cables and telegraphs to the Post Office Department, and this department concurred in this recommendation that the Post Office Department be granted authority to take over and operate the telegraph and telephone facilities of not only Alaska, but also Porto Rico and the Hawaiian Islands. This department has each year since I became Postmaster General submitted to the Congress an estimate of \$300,000 to cover the expenses involved in operating the Alaskan and insular services during the first year after their acquisition.

There is now pending before the Congress a bill prepared by Hon. David J. Lewis, a Representative from Maryland, authorizing the Post Office Department to acquire and extend the telephone system of the District of Columbia. I gave my indorsement of this bill, with the suggestion that any surplus accruing in the postal revenues for the fiscal year 1917 may be applied in payment for the properties described in the bill.

There is no essential difference in principle between communication by radio and communication by telegraph or telephone. The fundamental principle involved in all means of electrical communication is the transmission of intelligence, and this is distinctly a postal function and there is no logical or consistent reasoning that will sustain a proposition to place the licensing of stations and the fixing of rates, etc., for one means of electrical communication with another department while jurisdiction to some extent over other means of electrical communication is already lodged with the Post Office Department.

It is therefore recommended that the bill be amended so as to give to the Post Office Department instead of to the Department of Commerce jurisdiction over the licensing of stations, the fixing of rates, etc.

Very sincerely, yours,

A. S. BURLESON,  
*Postmaster General.*

AN ACT To aid in the construction of telegraph lines and to secure to the Government the use of the same for postal, military, and other purposes.

*Be it enacted by the Senate and the House of Representatives of the United States of America in Congress assembled, That any telegraph company now organized, or which may hereafter be organized under the laws of any State of*

this Union, shall have the right to construct, maintain, and operate lines of telegraph through and over any portion of the public domain of the United States, over and along any of the military or post roads of the United States which have been or may hereafter be declared such by act of Congress, and over, under, or across the navigable streams or waters of the United States: *Provided*, That such lines of telegraph shall be so constructed and maintained as not to obstruct the navigation of such streams and waters, or interfere with the ordinary travel on such military or post roads. And any of said companies shall have the right to take and use from such public lands the necessary stone, timber, and other materials for its posts, piers, stations, and other needful uses in the construction, maintenance, and operation of said lines of telegraph, and may preempt and use such portion of the unoccupied public lands subject to preemption through which its said lines of telegraph may be located as may be necessary for its stations, not exceeding forty acres for each station; but such stations shall not be within fifteen miles of each other.

SEC. 2. *And be it further enacted*, That telegraphic communications between the several departments of the Government of the United States and their officers and agents shall, in their transmission over the lines of any of said companies, have priority over all other business, and shall be sent at rates to be annually fixed by the Postmaster General.

SEC. 3. *And be it further enacted*, That the rights and privileges hereby granted shall not be transferred by any company acting under this act to any other corporation, association, or person: *Provided, however*, That the United States may at any time after the expiration of five years from the date of the passage of this act, for postal, military, or other purposes, purchase all the telegraph lines, property, and effects of any or all of said companies at an appraised value, to be ascertained by five competent, disinterested persons, two of whom shall be selected by the Postmaster General of the United States, two by the company interested, and one by the four so previously selected.

SEC. 4. *And be it further enacted*, That before any telegraph company shall exercise any of the powers or privileges conferred by this act, such company shall file their written acceptance with the Postmaster General of the restrictions and obligations required by this act.

Approved, July 24, 1866.

MR. DENNING (continuing). About the only other thing I wish to say, Mr. Chairman, in conclusion, is that so far as our information and observation of the work of the Navy Department is concerned, in its development of the art of the radio, we feel that the officers in charge of it deserve the highest commendation. There has been something said, I understand, to the effect that the art would not develop under the Government's control as it would under private control. We, in the Postal Service, who have been in the service a good many years, do not doubt but that if the Government ownership of the telegraph had continued as in the beginning, instead of there being telegraph service and telephone service now only to certain profitable points, there would have been service of both kinds over the same wires to practically every post office. The present operation of the parcel post extends to every post office in the United States, whereas the operation of the express companies does not extend to the unprofitable points. The Postal Service, through public necessity, extends its operation to any point where the people can be served. The Postal Service takes on additional activities, additional postal functions without the enormous economic loss attending the operation of such activities by a separate company. We think the Government control of the radio holds true in the same way, to say nothing of the military necessity for such a move.

That is all I have to say, unless there are some questions.

MR. SAUNDERS. I notice you refer to the parcel post; do you think there is any real analogy between the addition of the parcel post to

the activities of the Post Office Department, and taking over the wireless?

Mr. DENNING. There is no connection between them.

Mr. SAUNDERS. I say, is there any real analogy from which you can derive any helpful argument? In the parcel post, you had there a force already in operation, had the equipment and the training in connection with its activities; but should you take over this, you would not have those facilities.

Mr. DENNING. Only in this way; we would have those facilities now operated by the Navy Department, the Weather Bureau, and the War Department and a force which, as I understand it, can handle the work in the commercial field with very little extension.

Mr. SAUNDERS. Would any extension or the establishment of stations other than the present stations operated by the War and Navy Departments be necessary, or are they sufficient for the commercial uses of the entire country, having in mind the natural development of the uses of this system?

Mr. DENNING. As to that, I am not prepared to speak. There are certain technical features—

Mr. SAUNDERS. That is the reason I am asking if there is any real analogy between the two situations.

Mr. DENNING. Oh, I think so. The Government now has numerous stations, and this bill proposes to take over certain coastal stations. I understand that the Government now has probably 10 times more invested in wireless apparatus than private enterprises have, and it would not require as large an outlay to take over the commercial field as the commercial field now has invested in it; that is, to operate the commercial field.

Mr. SAUNDERS. Your recommendation as I understand it, then, goes a great deal further than the bill before the committee.

Mr. DENNING. Not at all.

Mr. SAUNDERS. The bill before the committee does not propose to take over the wireless system by the Government.

Mr. DENNING. It proposes to take over, as I understand it, all coastal stations and that the Government shall license certain other stations.

Mr. SAUNDERS. It proposes a regulatory control of the system and provides that the Government may, within a limited period, purchase any plants anybody wants to sell. That is all this bill undertakes to do.

Mr. DENNING. I know that is the provision of the bill. I should have qualified my remarks to conform to what I understand to be the recommendations of the Secretary of the Navy to take over all high-power stations.

Mr. SAUNDERS. That is just what I said—that your recommendation goes very much further than the bill we are considering.

Mr. DENNING. We are not so much concerned as to the individual provisions of the bill as we are to give you our position with reference to Government ownership and control of electrical means of communication.

Mr. SAUNDERS. That is what I was developing—that you go very much further than the bill.

Mr. DENNING. Yes; that is, as far as our position is concerned with reference to the telegraph and telephone.

Mr. SAUNDERS. As I understand, you say some suggestion has been made that the Post Office Department's policy in this matter has been influenced by political considerations?

Mr. DENNING. I could not see how that suggestion could be made, in view of the fact that the Post Office Department has for years past been in favor of the Government ownership and control of the telegraph systems.

Mr. SAUNDERS. I have not seen any suggestion of that sort anywhere. It may be bad judgment on the part of the Post Office Department, but I do not see what politics has to do with it.

Mr. DENNING. The suggestion has been made that the Postmasters General no doubt have been actuated from political considerations in making such recommendation.

Mr. SAUNDERS. I have not seen that, and I am curious to see how that could be worked out in anywise as an explanation of his attitude. The Postmaster General may be mistaken about this as a matter of sound policy. That is quite different. But I do not see how his recommendation could be related to any political advantage to the party to which he belongs.

The CHAIRMAN. I do not suppose anybody with good common sense could find any such advantage; but then I find a good many objections urged to proposed legislation which have no merit in them, and also legislation proposed that has no merit in it. In other words, people's minds operate in various ways.

Mr. GREENE. I think it would give the Postmaster General or any party a big club to take possession of all these facilities, myself.

The CHAIRMAN. I am in favor of the Government taking over the telegraph lines. So far as that is concerned, I am in complete accord with Postmasters General Wanamaker, Hitchcock, and Burleson on that question.

Mr. RODENBERG. I want to go on record as being unalterably opposed to it.

The CHAIRMAN. I do not mean to say for the Government to take over all the general activities of the telegraph companies, but there ought to be an instrument in every post office to either send a letter, a post card, or a message, and there ought to be an operator in every post office, and it ought to be a part of the post-office system. However, that the Government ought to take over the wireless establishment—I am not prepared to say as to that. That is a different proposition.

Mr. SAUNDERS. I was just going to say, on this matter of the suggestion that the attitude of the Post Office Department having emanated from political considerations, from the point of view of politics it seems to me it would be a very unprofitable thing for the Democrats to be related to it.

Mr. RODENBERG. It would be a disadvantage, from my point of view.

Mr. SAUNDERS. Yes.

Mr. DENNING. If I may make one further suggestion, possibly my statement in the matter has not been clearly understood in regard to the department's recommendation relative to the telegraph and telephone. The Government now has a monopoly over the transmission of letter mail, or first-class mail; that is, the transmission of intelligence so far as it is handled by means other than by wires

or electrical means. There have been numerous authorities who contend that there is no essential difference in the transmission of intelligence by wires and its transmission by means of carriers, and that the Government should have control over all means of the transmission of intelligence, regardless of the manner in which it is carried or sent. If we advocate Government ownership of electrical means of communication by telegraph and telephone, it is logical for us to urge Government ownership and control of the transmission of intelligence by wireless.

Mr. HADLEY. The Government, however, does not own the main arteries which transport the mail.

Mr. DENNING. But they are under the control of the Government.

Mr. RODENBERG. Yes; but to follow your argument to a logical conclusion you ought to advocate Government ownership of the railroads and everything else.

Mr. DENNING. Not at all, sir. We have the control. The agencies for the handling of mail are under the control of the Government.

Mr. GREENE. Mr. Chairman, as I understood it, the Navy Department and the War Department were interested in this radio matter as a matter of maintaining neutrality in our present troubles.

The CHAIRMAN. And for the national defense.

Mr. GREENE. Yes; and for the national defense. I did not understand we were to open up the theory of all the departments entirely outside of what we have under consideration now.

Mr. RODENBERG. I think it ought to be limited to the bill.

Mr. GREENE. If we are going to spend our time in getting this bill in shape I think we ought not to take on too many theoretical propositions outside of it, because we will get far afield.

Mr. HADLEY. I am frank to say the introduction of that collateral testimony will have no weight with me in a way that will tend to prejudice this bill in my mind.

Mr. GREENE. I think we ought to confine ourselves to this bill or nothing. If we are going into everything else, we shall not have anything in this bill.

The CHAIRMAN. I have read the letter of the Postmaster General. He is in accord with all the provisions of this bill; but he says he thinks the Post Office should take over the wireless instead of the Department of Commerce.

Mr. GREENE. Oh, yes; we know that very well.

The CHAIRMAN. Of course, the question of Government ownership of the telegraph is merely an incident.

Mr. GREENE. It is outside of this proposition we have before us.

The CHAIRMAN. Yes. I think they rest on an entirely different basis myself.

Is there anything further from Mr. Denning? If not, who will you have, Commander Todd?

Commander Todd. Will the committee listen to some further remarks from Capt. Bullard on the subject of neutrality?

The CHAIRMAN. Yes.

#### STATEMENT OF CAPT. W. H. G. BULLARD, UNITED STATES NAVY.

Capt. BULLARD. I should like to continue my remarks of Saturday with a little further amplification of the relation of this bill to amateurs.

The **CHAIRMAN**. I do not know, Capt. Bullard, whether some of these gentlemen were here on Saturday when you made your statement. You were chief of the Wireless Bureau in the Navy Department for how many years?

Capt. **BULLARD**. For practically four years; from its inception, until June—three years and nine months, practically.

The **CHAIRMAN**. And in June last you were ordered to sea, and are now in command of the battleship *Arkansas*?

Capt. **BULLARD**. Yes. It seems that there is such a consistent effort on the part of certain interests to protect the interests of the amateurs and in which principle I am in thorough accord, I would simply like to put in the hearings a few more words which will show, I think, that the object of this bill and our past relations with the amateurs is such that far from attempting to hurt or injure the amateurs, we are doing everything possible in the way of their up-building in their chosen profession of playing amateur with this high science and art.

All the amateurs, practically, on this coast are now recorded as far as we know them and can get hold of them in the office of the director of naval communications. Those amateurs are divided up into districts, under our district superintendents, and each amateur station has been, so far as we can, communicated with with an idea of asking their cooperation in time of trouble and to what extent they can help. This has been suggested to me by the statement of Prof. Marvin as to certain things which could be done in cooperation with the amateurs. This, I am glad to say, has been done, and there is now on file in the office of Commander Todd all this information. Take the district of New England, for instance, which embraces from Eastport to a station halfway down Long Island Sound: In that district every amateur known to exist has been communicated with and asked the status of his station, its power, its receiving and transmitting qualities, and that is a matter of record; and each one of those amateurs has been given a certain naval station with which to communicate if they have any information which they think would be of value to the Government. For instance, the Maine stations would communicate, if they are sufficiently powerful, with the station at Portland; if they are not powerful enough, they are authorized to communicate by telegraph, telephone, or mail any information which they think may be of value to the Government.

You must understand this is an organization for war time, and it is tested out periodically in times of peace. What we do is to mobilize those stations, so to speak, and put them on a war basis, say, for a week. Then these little stations imagine that they have seen something out of the way, or imagine that they have news, what we call constructive war news, which is passed on to that little station by us, and that station passes it on to the office here under the operation of the Navy Department. So these amateurs are taken care of and organized now; and as more of them come in, we get in touch with them and, as I say, we already have a record of their stations, what they can do, how far they can reach, and we give them the character of work which is commensurate with their power and ability. I have no doubt it would be interesting to the members of the committee to know that among these amateurs are several of the female species who have volunteered their stations, and quite a few

of those women take a pride in this and have joined this organization voluntarily.

In addition to this, as superintendent of our service, I had the pleasure of accepting honorary membership, as vice president, of two of the biggest amateur wireless associations in the United States, and I have no doubt but that my successor has been asked to serve also in that capacity. I bring this out to show that there has been no effort on the part of the Government to discourage in any way, but it has been our one ambition to build up and show where they can do better and increase the national organization for national defense. These volunteers in this organization all have complete instructions. Further than that, many of them—and when I say many I mean a great many—have volunteered to enlist for such period as the Government may desire in times of war and trouble. Those names are kept on file. Many of them have joined one or more of the various forms of fleet reserve which were brought into being by the last naval appropriation act in the last Congress. They are enrolled and some of them are now going to sea. They serve for one or two months each year on board of one of our seagoing ships, and at other stations, and they are getting the practice necessary to train them to carry on the Government's work.

That is simply to show that, as far as the Navy is concerned, its activities are toward the uplift of the amateurs and not to destroy them in any way; and we can not see that this bill is in any way going to interfere with their activities at all.

Now, I should like to call your attention to one or two sections of this bill that relate in a general way to the question of neutrality. I think sections 14 and 15, and a further section later on, relate somewhat along that line, section 25. It may be said that this question of introducing sections into this bill relating to the general broad question of neutrality probably met with greater trouble than almost any section of the bill. Among the members of the committee which drew up this bill was Mr. Warren, one of the assistant attorney generals of the Department of Justice, who lent us every possible means at his command in order that the language should be properly drawn up as relating to the legal phrases, definitions, and so on. I think it was rather the attempt of the committee at that time to sidestep the question of such acts and parts of acts as are taken care of in sections 14 and 15, with the idea that the Department of Justice would offer a general blanket bill covering all phases of the neutrality question; but they were so overwhelmed with work that they could not apparently get to that proposition, so we decided rather than have nothing we would have a little in here, if we could get it, relating to the general questions of neutrality and violations of neutrality.

There are very few acts on our law books that relate in any way to punishments for the commission of crimes against neutrality. Questions relating to that have been left in the hands of the executive departments of the Government. There is nothing I know of now on the statute books that defines what are offenses against the neutrality of the country; probably the lawmakers believing the proper place to leave that was in the hands of the executive departments of the Government, particularly the President. These sections are de-

signed somewhat to cover propositions that have come up in the past—sections 14 and 15. There was a section in the original bill which gave the President authority under certain conditions to close stations by Executive order or turn them over to any department of the Government for use; but conditions have arisen during the past year when that act was in effect when the President himself felt he should go further, and he issued a general order in a proclamation. And in that general order or proclamation relating to neutrality certain regulations were drawn up as affecting neutrality concerned with the transmission of messages to ships at sea.

It is a matter of record that the Navy Department now, under that President's Executive order, is operating two of the highest-powered stations in the United States, one situated at Tuckerton, N. J., and the other at Sayville, on Long Island, about halfway down the island. These two stations are very fine stations, high-powered stations, which were designed to communicate with the Continent of Europe and which daily do so, day and night—communicate with corresponding stations in Germany. It might be of interest to remark here they were German stations built on this coast, built by German capital and operated by German operators, all of which we have strived to correct in this bill by provisions which prevent certain ownerships of stock by aliens, and all that sort of thing, which you can read through here. We have, in fact, although they deny it, the proposition of representatives of a foreign Government coming right over into our country, building these high-powered stations directly under laws and regulations that are drawn up by their own Government. Can anyone imagine what would be the effect if an American corporation or individual should go to Germany and buy land and put up a high-powered station there? What would be the effect? He would be shown the front door out of the country; and yet there is no provision of law now to prevent any person in the world coming into this country, acquiring real estate and building these high-powered stations, and practically operating under German or other laws. I do not use this word "German" in any offensive manner; simply because those two stations are now operated and generally known as German stations.

Mr. RODENBERG. How many foreign-owned stations are there in this country that you know of?

Capt. BULLARD. That expression "foreign-owned"—

Mr. RODENBERG. Owned by foreign interests?

Capt. BULLARD. I could not say, because really, under the operation of our laws, there are no foreign-owned stations. They must form an American company, you see, before they can apply for and obtain a license, and so they are American owned. Therefore, they get around this proposition, and it is very difficult to say what are foreign-owned or foreign-controlled. They form American companies to take over the holdings of the European companies, and those American companies apply for the license. So, on the face of it, they are American companies; although, as a matter of fact, they are not—their capital stock is still held abroad and their policy is determined abroad.

Mr. RODENBERG. You do not know how many stations, then, have been capitalized by Europeans?

Capt. BULLARD. No; I could not say any more than these two particular stations that I know of, Tuckerton and Sayville. Those two stations are admittedly so capitalized. They were admittedly built by foreign capital and officered by foreign citizens. Each, however, formed an American company, and I can say now, and I believe with full credit to the company operating the Sayville station, that they all claim to be full American citizens. Those who were not American citizens at the outbreak of the war have since become naturalized American citizens, and I believe that it is a question of pride with them now to claim that they are fully naturalized American citizens and imbued with that spirit which should go with American citizenship; but certainly that was not the case when that station was built, and of course it is a question of doubt as to how far their policy still continues to be controlled by the company that gave them support and gave them the money to build the station in the first place.

The Navy Department, at the beginning of the war, felt that it was necessary in the interests of our neutrality to take over the operation of the Tuckerton station. The history of this station is unique in the fact that its ownership was in doubt and is still in doubt and is the subject of a suit in one of the United States courts in New Jersey. The land, so far as our investigation shows, on which this station is built, is owned by a German citizen, a German subject, who now resides in Germany. Under the laws of New Jersey an alien is allowed to own land in New Jersey, and this land is held in fee by this individual. On this land was built this station, and after it was built by this German money and German patents and German apparatus installed—after this station was built they were approached by a French company with a proposition to buy the station. A contract was drawn up to purchase this station and this German station was erected with the understanding that the French company should pay annual installments as the station went up, withholding the last payment until a final acceptance trial was made and it was in successful operation. Our best information is this French company had paid before the outbreak of the war 90 per cent of the value of the station—the other 10 per cent to be held in abeyance until the station had successfully made its trials, which was the transmission and reception of so many words per minute across the Atlantic with the corresponding station in Germany. At the outbreak of the war this, of course, was all changed, and this has now become a question of dispute between German and French subjects in our own territory right in the heart of our most populous district. These Germans were still in possession as being the constructing contractors. They were in possession, and they refused to give up possession. The representatives of the French company agreed to waive the proposition of having these tests and offered them the remaining 10 per cent of their price so they could have a French officer in command; but the German representatives in charge refused to move, and they have since successfully refused to move, and are still there as the representatives of the German company.

In order for this station to do business at all under the present radio act it is required to have a license from the Department of

Commerce. Knowing foreign companies could not get a license they each went to the extent of forming American companies, which they could conveniently do by getting certain kinds of American citizens to serve as officers of the American concerns with different names, with different officers and everything else, and title turned over to them, and then those two American companies, one representing the German side and one representing the French side, applied for a license to operate the station. That was done. Those two American companies then applied to the Department of Commerce for a license to operate that station, and the Secretary of Commerce, on learning the circumstances, very properly refused to issue the license to either of these contestants.

Then the question came up what should be done with this beautiful station that could communicate with Germany when there was no one authorized or could be given a license to operate it. It was then that the Navy Department stepped in and said, with the approval of the other departments and under the President's proclamation, that the Navy Department would operate the station if it was agreeable to the other departments concerned. As it seemed at that time the Navy Department was the only one which had the organization ready and the operators ready to take over the operation of that station, on approval of the President that was done. The Navy Department then sent an officer and operators to the Tuckerton station to operate it, as it was felt it would be a shame to allow this beautiful station to lie idle when all other means of communication with Germany were broken and this was the only means left. The cable to Germany had been cut and Germany was without any communication, and rather than have no communication this station was operated and is still being operated by the Navy Department.

Now, the question of ownership of the station is still in dispute and is still a subject of litigation before the courts. The station is operated under regulations and instructions drawn up by the Navy Department, so that for its neutrality purposes and for its ordinary purposes the organization, administration, and accounting for the money that is taken in as the earnings of the station are held in trust by the Navy Department, to be finally turned over to whichever company is decided to be the right owner of the station; and we can say, with a feeling of pride, that whoever will get this station finally will find a very handsome nestegg awaiting them in the Treasury of the United States; and I can also say with a feeling of pride that in the administration of that service up to the time I left, if my memory serves me right, we had operated that station for whoever may be determined hereafter to be the rightful owner, taking into account all overhead charges, running expenses, and so forth, and appraising their station at \$400,000 (which was quite a big value), and had cleared, I think, if my memory serves me right, and were ready to turn over 30 per cent of the investment to the owners. So it can be seen that our stewardship has been a success and a good one.

I simply mention this to show the fact that the Navy Department is in a position to do that with all stations or any stations, on account of its thorough organization and the administrative details which it

has worked out. This station, as I say, was taken over to preserve our neutrality, in order that there would be some one there to prevent unneutral messages being sent to ships at sea so that they could be picked up by belligerent vessels to their own advantage; and we confidently hope that station has not been engaged in sending any unneutral messages.

The operation of Sayville was somewhat along the same lines. Sayville was a station which was in operation before the beginning of the war, but it was not quite powerful enough to reach Germany under all conditions, especially during the summer season, when the static disturbances in the atmosphere are very severe. The operating department of their company applied to the Department of Commerce to put in better apparatus and a higher power. This was done. The Department of Commerce very properly conceived the idea that this was, in effect, the building of a new station and therefore became subject to a new license, and when the time came for them to apply for a new license the Department of Commerce, for reasons developed in conference between the Secretary of Commerce, the Secretary of the Navy, and some of the other executive officers, refused a license to Sayville. It had been under strong suspicion that many unneutral messages had been sent from Sayville and outside interests were brought to bear, and the interests of the Government seemed to indicate it would be a part of wisdom for the Government to take over Sayville and operate it as it had operated Tuckerton. It was taken over under the same conditions as Tuckerton, with the exception of the accounting features. As there was no question of ownership the money accruing as earnings had to go directly to the Sayville station, and the Navy was only concerned in operating it and furnishing the officers and men to do this, and to see that the neutrality proclamation of the President was distinctly carried out.

Now it becomes necessary—and that is the excuse for putting in these sections 14 and 15 here, which I think all agree, possibly, are very necessary to cover these difficulties we have met with in the past, and, as I say, there is one other section, 25, that relates somewhat along that line, although it does not say so—to provide:

That whoever, including any person in the service of the Government, shall knowingly transmit or publish, or knowingly cause to be transmitted or published, any false or fraudulent distress radiogram, or who, when engaged in radio communication shall transmit or publish, or cause to be transmitted or published, any other radiogram for the purpose of defrauding or deceiving the Government, shall be punished by a fine not exceeding \$2,000.

And so on.

Now the words "any other radiogram, for the purpose of defrauding or deceiving the Government," that was put in there to make our neutrality regulations a little bit stronger. If my memory serves me right this was brought about by certain cases where messages had been sent which were apparently in plain English and apparently had no relation to any proposition, and yet were intended to and did deceive and defraud the Government. I can recall one instance of a ship which was sailing from New York carrying certain apparatus as a part of her cargo, and when she was out at sea the owner or agent on board sent back a message to the owner or agent on shore as to what the disposition of certain parts in this country had

been. The naval censor at the station through which this message passed became suspicious of this message and refused to pass it unless he had further authority from the Navy Department. He communicated further with the censor we had here, and the answer was that this message related to machines having to do with the Red Cross, I think. Still this young naval censor of this station was suspicious for some reason or other—apparently he was of a suspicious nature—and he refused to pass the message at all. He telegraphed to the Navy Department and, unfortunately, addressed his telegram to the Secretary of the Navy, which is quite an unusual procedure.

The Secretary of the Navy received this telegram in his home at an hour when he was unaccustomed to receiving telegrams. As far as he could see at that time there was no reason for holding up the message, and he simply had a message sent back to pass the message, and it was passed. Further investigation developed that those machines for Red Cross use turned out to be flying machines for use of one of the belligerent powers, which were shipped from Canada over into the United States and put aboard at New York and went out on this ship.

Now these messages that he sent back; they were not messages that contained, apparently, anything that constituted a violation of our neutrality, and they were true messages as far as they were received, but they were intended to deceive and defraud the Government of the United States; and in this case they did succeed in defrauding and deceiving, although the messages themselves were in plain English; but apparently they conformed to some code with the agent on shore, although the agent on shore was not quite sure of his code, because he was the one who gave the whole thing away. He said he was not quite in accord with the agent on ship and did not understand, and came out and said that these were flying machines intended for one of the belligerents.

The CHAIRMAN. Instead of machines for the Red Cross?

Capt. BULLARD. Yes. So this was put in there for that purpose. And there are many other complaints filed in the Department of Justice that would be covered by that very language, of messages intended to deceive and defraud, although they may be perfectly clear, plain English messages. Of course, if a person can send an English message through, carrying a hidden code, all well and good; they are just that much smarter than those who receive them, and we can not get hold of them; but if it can be proved that they are intended to deceive and defraud then we can get some hold on them.

It happens to be a matter of record at the present time that one of the English ships just entering the English Channel was turned back by a message sent by somebody on shore to the effect that the captain had the measles. That was a very plain message, and yet that measles proposition meant to that captain that war was declared, and to proceed to a point of safety immediately. Those are just little illustrations of events that have come to us in the past years in trying to take care of our neutrality proclamation, and which at present is not a subject of law, and, I think, in many cases is properly not a subject of law; because if it were then we would just be tied down to

legal expressions, whereas if it is left as at present, of course the Executive can handle it in a bigger way. These two sections were put in here on the recommendation of the committee to cover just the few points that have not been brought out. It was the intent, as I said, to leave these out and to put in one general blanket neutrality act, which the Department of Justice proposed to draw up and submit to the present Congress; but they never got that far, and did not do it, and the committee, feeling that this matter of radio neutrality should be protected in some way, included those three sections in here. That is the excuse for these sections being in here at this time.

The other sections relating to the divulgence of messages, and so on, are practically the same as in the present act, and contain no changes. I notice these are the only ones.

Of course, the operation and administration of the radio service is so filled with many examples of complex propositions that I could continue to talk for days just in the conversational line I am now without bringing up any argument for the particular features of this bill, but I want to continue to go on record as being strongly in favor of the bill, and say it has only been drawn up after very, very careful consideration; that we have seen those things operating and have been perfectly helpless to correct them, and we have come to Congress and asked for these things which we think will correct that situation and provide proper control and proper regulation of this art that uses the one common atmosphere for its transmission, and in which we do not believe title should be given to anybody to use except the General Government.

If my information is correct, it has been suggested that an amendment be added to the bill which goes a little further than the bill does. I might say, with all due deference to my conferees and those with whom I worked, that I personally can not bring myself to see that that will be a desirable feature at this time.

Mr. GREENE. To what do you refer there?

Capt. BULLARD. The acquirement of the high-powered stations. Although I believe, and can not help from believing, that would come in time if this bill became a law; yet it seems to me it is not quite the time to make that a matter of national legislation. And I can not get myself in accord with some of my conferees along that line, and I believe the bill, as it stands, is as near a perfect solution of our proposition as we could desire at this time. I say that from the fact that we do not propose, as I have tried clearly to bring out, to touch the amateurs, which is the class that use low-wave lengths and very low power. Then we go up to the middle class, which is the coastal communication, which uses a medium wave length. That is required by our international obligations under the London Convention of 1912. And where we use a moderate power, that is the place we think we should step in and take control, and possibly ownership, for the reason that the apparatus has, to a certain extent, been more or less standardized; the regulations of the world have provided the standards, and there seems very little chance for improvement along that line except possibly in receiving sets that may be designed in the way of better selectivity and which will answer better to sharper tuning. Now, when you get outside of that, you get into the realm of the high-powered stations and long wave lengths, where the real

engineers and scientists are concerned in the development of the art, and leaving out the amateurs that are away down on the scale. And I believe that region up there of the long-wave length and high power should be left for the scientists and engineers to play with as they see fit, under proper regulation, which this bill gives, and which regulates certain wave lengths which are theirs to use.

We have seen recently the development of a wireless telephone. That is in that region up there of high power and long-wave length. And there are many other instances of the development of the art that will come along that will readily find their way into that space. So, I would say I consider that space should be left for the scientists, the experimenter, and the engineer, because they are the unknown depths in which they can experiment and develop and carry out their researches as they see fit. But this medium region, which is the one for communication with ships at sea, has been more or less standardized, and there is very little chance for change in there, except along the lines which I explained, of developing a little better selectivity in transmission and receiving. The receiving has possibly been developed as far as it can. And there is the place where I think the Government can properly step in and take over the control absolutely, leaving the two extremes open. The amateur it does not disturb at all, and the field of the long-wave length is left for the radio scientist, engineer, and research man to play with as he sees fit.

Mr. HADLEY. You believe that if the high-power stations were left outstanding, they would not be a menace to the national security?

Capt. BULLARD. Not under the provisions and regulations provided in this bill; but I do believe it would tend in the future to gravitate toward general Government ownership, but not necessarily at this time. It might not be for years, during which time many new devices might be developed up in that region.

The CHAIRMAN. This bill provides that in the event of war or in time of public danger or disaster all stations may be taken over.

Capt. BULLARD. Oh, yes; to be taken over in time of war or public danger; and that is properly taken care of under this bill.

The CHAIRMAN. Not taken over permanently, but taken over and dismantled for the time being and placed under the direct supervision and control of the Government.

Capt. BULLARD. Exactly.

Mr. HADLEY. That would be a temporary taking over for war purposes?

Capt. BULLARD. A temporary taking over for war purposes.

Mr. HADLEY. Whereas the amendment proposes the permanent taking over?

Capt. BULLARD. Yes.

Mr. ROWE. Are the high-powered stations the ones chiefly used for commercial business purposes?

Capt. BULLARD. That is a question which possibly would have to be a little qualified as to what you mean by commercial business. The two high-powered stations at Tuckerton and Sayville, which are daily communicating with Germany, are apparently commercial stations. They are nothing else but commercial stations. They do not even communicate with ships at sea now, and they do not do that because of our neutrality regulations, which won't allow them. So their activities are concerned with transmitting messages to Germany.

The high-powered stations on the west coast I do not believe communicate with the ships at sea. It is a different character of apparatus; it is high-powered apparatus, and you would not care to have a man doing a boy's work if he has a man's work to do.

The stations on the west coast, most of them—for instance, two or three high-powered stations—communicate with Honolulu and stations near Honolulu and not with ship stations. So to that extent they only do this commercial business. It may be in the future we will see these stations spread all through the interior of the country for communication between fixed points, in competition with the telegraph and telephone lines. When that time comes, if the control and regulation is not sufficient in this bill, then we will have to come and ask for better control, if it is going to interfere with communication with ships at sea; but if it does not interfere with communication with ships at sea, I do not think we will ever be back here again to ask for any more regulations. What will be the result then is that there will probably be so many of those they will interfere with one another very completely, and they will have to fight it out among themselves. What we are concerned in primarily, and the basic principle of this bill, as I understand, is the prevention of interference with ships at sea, so that we can get messages to ships at sea, where there are no other means of communication with them. The people on board ships at sea are helpless so far as communication goes, except by radio. The people on shore do not have to depend on wireless; they can go into a telegraph office or a telephone office, or have recourse to the mails, or send a messenger on horseback or by boat or in any other way; but the man at sea has only this one means of communication, and it is this one means of communication that we are trying in this bill to protect, so that he can get his communications back and forth without the interference that is experienced now, and which can be lessened very, very materially by having the one control.

Mr. SAUNDERS. You spoke a moment ago of a low wave. What is a low wave?

Capt. BULLARD. Well, sir, that would be getting you into a technical discussion which I do not believe you would know very much more about when I get through trying to tell you. It is simply a characteristic of those waves which you might say accompanies low power, although, of course, that is not a particular attribute of a low wave. Those waves are sent out at certain definite frequencies. One factor is the frequency of the wave length, and the other is wave length, and their product is constant. If it is a high frequency, it is a low wave length, and vice versa. A low wave length or short wave length generally applies to stations of small power.

Mr. SAUNDERS. That is what I had in mind, that a low wave and short wave length are the same thing.

Capt. BULLARD. Yes, sir.

Mr. SAUNDERS. That is the same thing as low wave?

Capt. BULLARD. Yes, sir; I would say so.

Mr. SAUNDERS. That is what I had in mind, whether they were the same thing or there was a distinction.

Capt. BULLARD. I would not say those terms are synonymous; but a low wave length generally accompanies low power, while we associate high power with long wave lengths.

Mr. SAUNDERS. There is no difficulty, I think, of having a pretty good working knowledge of the short and long wave length.

Capt. BULLARD. It is the difference of the note, what might be compared to the striking of a key away down on the bass of the piano and a key away up in the treble; the one giving a short wave length and the other a long wave length. That is where it gets its analogy.

Mr. SAUNDERS. I suppose it is pretty much like the ripples on the surface of the water, the long ripples and the short ripples.

Capt. BULLARD. Yes; there are many common analogies.

Mr. SAUNDERS. If a low wave and a short wave are the same, I think I understand pretty well what you mean.

Capt. BULLARD. The law now compels the amateur to use the short length, and when sending with wave lengths of a certain value there is not so much interference as they have when different wave lengths are being used; and where one standard wave length is being used, as required by the international convention—you might say we are bound by that convention—it produces interference as when lots of people are trying to talk and cross talk along the same line.

Mr. SAUNDERS. I imagine it is like a lot of people trying to talk in a room, all using a medium tone of voice.

Capt. BULLARD. Exactly.

Mr. SAUNDERS. And the crossing of the sound waves confuse each other.

Capt. BULLARD. Yes. A man with a very shrill voice in the room could be heard, whereas the man with a low voice, a base voice, could not be heard because of the confusion.

Mr. SAUNDERS. Those terms "short wave length" and "long wave length" are used as a working hypothesis?

Capt. BULLARD. Yes; they cover a great multitude of sins.

The CHAIRMAN. As I understand you, the wave lengths up to 600, in the provisions of the bill, are used or may be used for commercial purposes, and from 600 to 1,600 they are reserved for governmental use?

Capt. BULLARD. Yes, sir.

The CHAIRMAN. And then between 1,600 and 1,800 there seems to be an open space, and then the wave length of 1,800 is also reserved. Why is that provision made as between 600 and 1,600 and then the 1,800 meters wave length?

Capt. BULLARD. It is simply a matter of wider range. The 1,800 is required by international obligations that commercial interests can not use that wave length, except in special cases; that they must use a wave length of 600 or less; or, if they want to communicate over another station, they must use a wave length of 1,800 or above. That is why that is copied in here, because we can not disturb our international obligations. If a ship station, for instance, wants to communicate with a shore station, it is required ordinarily that a ship at sea has to communicate with the nearest shore station; and, if it does, it must communicate with a certain wave length, 600 meters; but if, for some reason or other, it does not wish to do that, but to go over the head of some other shore station, it can do that, and does do it, under the regulations if it uses a wave length of 1,800 meters, so that it won't disturb some one else using that space operating at 600 meters. That is kept in here for that reason.

Mr. SAUNDERS. A wave length of 600 meters; that don't mean oscillation of the ether 600 meters long, does it?

Capt. BULLARD. Yes; that is exactly what it means.

Mr. GREENE. Has there been any development of the receiving and sending apparatus by the Navy Department, or has that been done by private enterprise?

Capt. BULLARD. I should say both. At the Navy Department we say what we want and ask these different people to furnish it, and they come as near to it as they can. We say that is not good enough; go off about your business and try to get something better, and they do.

Mr. GREENE. That is done by private enterprise rather than by the Navy Department itself.

Capt. BULLARD. We do have our own scientists and engineers, who develop them as far as they can and enter into friendly competition with these outside concerns, and whoever gets the best that is what we take. I think that has been the policy of the Navy Department for years, especially of the radio service, only to take the best, and we require the best and nothing else wherever that can be obtained; and for the radio development, it has been the policy of the department, whenever we get a new proposition, to go to the men on the outside and ask them what they can do for us. Sometimes they start to work and reach it right away and sometimes they fall short. When they fall short we encourage them, but tell them, "You have not gone far enough; we will turn that over to another company and see what they can do"; and the first thing we know we have several of these companies and engineers competing with one another, and when they get started they take a little pride in trying to produce what we want. That has always been the case with our stations now, operated by Government men, and would possibly be more so if all the stations were under Government ownership, because then there would be the one great market for the apparatus and the Government would be the companies' and engineers' one best customer.

Mr. SAUNDERS. The longer these wave lengths are, the greater the distance to which they are supposed to penetrate. I know, theoretically, a wave is supposed to go on indefinitely.

Capt. BULLARD. I should say so; yes. As a general proposition, the art seems to find the longer the wave length the less trouble from meeting obstructions; in other words, they will go around obstructions better than the shorter wave lengths, although possibly not so efficiently.

Mr. SAUNDERS. The greater working distance they obtain?

Capt. BULLARD. Yes; as a general proposition. Of course, there are many analogies that might be used to explain that. One of the simplest is the old analogy of a spot of light which, when it strikes a corner, will make a shadow. That represents what you might call a short-wave length; the short-wave length hits an obstacle and causes a shadow on the other side. Whereas the human voice, in talking—which has a very much longer wave length than any electrical apparatus would produce—when it struck the obstruction would go around and you could hear the voice on the other side. The people outside of here can hear my voice because it goes around and bends around the corner; but the ray of light would not; but it

would make a shadow right across there. That is somewhat the same analogy as the short wave and the long wave. The long wave when it strikes the hills and mountains does not make any shadows; there is no stopping of any kind, but it bends around and, therefore, is propagated farther and holds on better and goes farther. So I should say, as a general proposition, the longer wave lengths are used for long transmission; but that is mixed up with questions of efficiency, which should not be confused with it.

The CHAIRMAN. Captain, we are very glad to have had you with us. You have given us a great deal of information.

Capt. BULLARD. I am very sorry that I can not remain to hear what the other gentlemen have to say; but I must go back to my ship to-night, as we sail within a day or two to the West Indies to join the fleet.

Commander TODD. I will introduce Lieut. S. C. Hooper, in charge of the wireless division of the Bureau of Steam Engineering, who is more up on the actual development of the apparatus as we get it to-day than any expert we have. He knows more about the subject of interference than anyone else, because he is himself an expert operator and has served as fleet radio officer of the Atlantic Fleet. He has personal knowledge of the operating conditions on the Atlantic coast, and there is no better authority on actual interference obtainable.

#### STATEMENT OF LIEUT. S. C. HOOPER, UNITED STATES NAVY.

The CHAIRMAN. What is your relation to this wireless service?

Lieut. HOOPER. I have charge of the construction of stations, the upkeep and maintenance of stations, and the design, development, and purchase of all radio apparatus and the equipment of ships with radio apparatus. In other words, everything except matters pertaining to the operation of the Radio Service in the Navy, questions of neutrality, and so forth, which have to do with operations and are under Commander Todd's office. As fleet radio officer during my last cruise at sea and during my period on shore in charge of the construction of stations and the purchase of apparatus, I have had an excellent opportunity to study the whole radio situation as it exists, especially the practical interference problems, as I have listened in and operated in all parts of the world—naturally, as we go from one ocean to the other—and also the actual apparatus and development problem, through my connection with the Bureau of Steam Engineering in the purchase of apparatus; and I would like to say that any decision which is made in connection with this proposed bill must be based not only on the theoretical possibilities, which in themselves are not sufficient to permit two separate organizations occupying the same field, due to interference troubles, but the study of the operation requirements—the class of men which must be employed, the limited funds which must always be available, either of the Government or any commercial concern, to conduct any business, and the various peculiar conditions met with by the ships operating in different zones, has caused me to decide, as much as I may or may not be concerned, between the policy of Government ownership and private control, that a monopoly is necessary in the case of radio communication.

There have been marked increases in efficiency in high-powered stations in the last few years and a few changes in efficiency in commercial stations. The improvements in apparatus have not kept pace, however, with the use and scope and the requirements of the art, nor will they ever to the extent that rival concerns can divide up the air as efficiently as one concern.

We have many plans for the use of the radio, both for the Government to assist commerce and navigation, for military purposes, and for other important purposes, which must be withheld and delayed, due to the fact that science is not able to devise a means whereby these uses may be effective without confusion, interference, and the resulting inefficiency. In other words, as fast as the art develops we find so many new uses which are absolutely necessary for the handling of messages between ships at sea and between the shore and the ships, and to assist in navigation, and all that, that science can not keep up with our demands.

The first task is now to clear the air so that ordinary man may use it to the best advantage. To do this some one concern on each coast must have a monopoly. If it were not for the military requirements which embarrass countries in these days and threaten to embarrass them throughout our generation, it might be said to be immaterial whether the Government or a private commercial concern exercised this monopoly; but for military reasons it is necessary that the Navy own and operate the coastal stations, to be always ready, instantaneously, and for the fact that the Radio Service will soon play an important part in assisting navigators to pilot safely vessels, especially in foggy and thick weather, the Department of Commerce must maintain a strong interest in the matter. So it is better, then, that the Government exercise this monopoly, if a monopoly is necessary.

Experts will state that the increased efficiency in the art will render a monopoly unnecessary. I am convinced that this is not true; that as improvement continues, the increased necessity for improvements in the way of greater scope will make this monopoly all the more necessary. In my capacity in charge of equipping ship and shore stations, the purchase of apparatus for naval stations and for naval ships, and for the United States Navy in general, I am sure that the Navy is the most extensive purchaser of radio apparatus in the world; that is, our Navy. I have become thoroughly familiar with the prospects for improvements, with the hopes of the inventors, and feel qualified to state positively that with Government ownership of the small coastal stations the art will not suffer in any way, but the opposite result will be achieved—it will receive a greater impetus. Just as much and more apparatus will be purchased and from just as many companies. The Navy practically keeps these companies alive to-day by its purchases. Every prominent radio manufacturer in the United States is working hard for the Navy. During the last two months alone the Navy Department has placed contracts for roughly \$400,000 worth of radio apparatus. The department is alert for the latest apparatus, and every reliable concern is constantly submitting new samples for tests. Undoubtedly, many feel we are slow in accepting some minor new ideas, and I do not blame them, but we must consider that every change made in a standard is a further complication to render operation difficult by the operators at sea, and constant

changes greatly handicap efficiency for this reason. What we must always consider is the question of whether the slight increase of efficiency is worth the handicap to the men who operate the apparatus. The operation must be considered always first, and not the slight increased result; not what the apparatus might do with the more skillful man than is possible under any conditions to be obtained for such work.

The attempt will be made in these hearings to lead the committee astray from the main issue, by discussing disadvantages to the art. The art is the apparatus, and the Government will no more reduce the interest in the apparatus by taking over its use than it does at present.

With these few words about the development of the art, I will discuss the question of interference, with which I am quite familiar. I have listened in on both coasts, a great deal in Europe, and the Mediterranean, even in war time, and I have come to the belief that the interference question is absolutely unsolvable except by Government ownership of coast stations. It can always be proved, apparently, by the scientists that we should not have any interference, but it can not be done. In the operation there is interference all the time between the ships, between ship and shore stations, and between rival shore stations, and there always will be unless the Government takes over the coastal stations. I have heard it stated, even recently, that there is no interference between the Navy and shore stations, and yet you can go into any locality at any time and see that there is the most serious interference. Within the last two months I was in New Orleans. I went into our naval station at the New Orleans Navy Yard and called up some vessel, and immediately the two commercial stations in New Orleans called the New Orleans naval station and told him to keep quiet, that they were sending or receiving from ships. There was an example where only one station can work at a time, and yet our wave lengths are very widely different from theirs. We were on quite a long wave length, and the commercial station there was working with a ship, and the ship's wave length is the short-wave length; and yet the minute the naval station started to send, the commercial station could not receive the ship at all, and he told me that I must keep quiet. That is what happens all along the coast. You have two or three stations in a restricted area, and one has to wait until the other gets through. It would be much more efficient if you had just the one station there handling all the work, and there would not be any argument about it at any time.

I went to Key West and while I was attempting to work with one of our ships from the Key West naval radio station, one of the merchant ships passing close by Key West started to call the Marconi station at Tampa, Fla., which is several hundred miles away from Key West, and I was unable to receive anything from the ship I was attempting to work with, several hundred miles away, because the ship close by would insist on calling a station some distance away and trying to work with it, knowingly interfering, in spite of the international regulations. The ship close by should really have given her message to me as being the nearest coastal station; but the ships have operators who are loyal to the concerns for which they work. For example, if they are working for the Marconi company, they won't give their message to the nearest coastal station at all times if

by any possibility they can work with a Marconi station. In this case the passing ship should have given her message to Key West. They were within 10 miles of Key West, but they did not do that, the operator insisting on calling a station 300 miles away and making so much noise I could not work with any ship, even the one which should have logically worked with me. If they had given the message to me at Key West, they could have done it on low power and it would have made no trouble.

Those conditions exist at many of the coastal stations and always will exist as long as you have two companies in the field. The companies have a hold on the men who operate the sets, men in their employ, and these operators try to give their messages to their own companies' stations, no matter where they are, even though it interferes with the naval station or the shore station of some other company. There always will be that feeling of loyalty between the operators of a company and that company's stations.

There are a good many troubles also because the commercial operators won't recognize any one coastal station as the controlling station. The commercial operators think that the commercial stations only ought to control and they won't pay any attention sometimes to the naval station when they are told to keep quiet; and the naval operator will think that the naval station ought to control the situation and won't pay any attention to the commercial station. When the question of interference has to be settled immediately on account of a distress call, both sides try to take charge and refuse to give way to the other. That happens right along. I have heard a ship make an S O S, and then a disgraceful condition would follow where several shore stations attempted to communicate with the ship, and several ships and the nearest naval station and the nearest commercial station would all try to take control of the situation and nobody would obey orders from anywhere. Now, there has got to be one company running the whole business; it has got to be the Navy or some commercial company, and then the operators will respect the rules of that one company. The Navy is better qualified to do it because the Navy operators are disciplined; they understand that they have to carry out orders; the military service always does have more disciplined employees. They are trained to discipline, that is their first idea, and discipline in the air is absolutely essential. I do not complain that the commercial operators do not try to respect the rules or that they do not have discipline in their companies; but, naturally, they can not be expected to have the discipline we have in the military service. That is what we are; we represent discipline, and the operators have that bred in them.

You can go in many places along the coasts and find the most serious conditions of interference. Here at Norfolk there is a naval station and a commercial station within 10 or 15 miles of each other, and they are both trying to work with ships at sea, and there is all sorts of interference there. We have had to take turns working, to make way for each other, and in taking turns there is bound to be a lot of lost motion and delays and serious inconvenience, and unimportant messages are given the right of way over important messages, and important messages are delayed because there is no one station in control.

Mr. GREENE. Let me ask you a question right here. Of course, while I realize that in matters of neutrality, or anything of that kind, or anything that affects the country's interest, the Navy ought to have precedence; still, if you are going to destroy the business operations by an arbitrary power, why is not that going to be disadvantageous? Could there not be some attention given to the business interests? If the Navy gets possession, are they going to take possession and deny the business interests any opportunity?

Lieut. HOOPER. No, sir. The idea is to handle all the business, and when a crisis comes, like a ship in distress, or something of great emergency, the matter can only receive proper consideration from one head office.

Mr. GREENE. Those things do not occur every day?

Lieut. HOOPER. No, sir.

Mr. GREENE. They only occur incidentally, once in a while?

Lieut. HOOPER. Yes, sir; but when they do occur they are of the greatest importance.

Mr. GREENE. Oh, I agree to that.

Lieut. HOOPER. It is the same way at Boston. I have taken the key at Boston and called up a vessel to send a message to it and been told by the station there to keep quiet, that they were receiving from some station.

Mr. GREENE. Is there not some chatting going on between the naval stations sometimes outside of legitimate business?

Lieut. HOOPER. No, sir; we have the most stringent rules about that; both the Navy and commercial companies have very stringent rules about that. It used to be, a few years ago, when there was chatting going on all the time; but that was before the present law went into effect, and now the matter is pretty well under control through the combined efforts of both the commercial stations and the Navy. The chatting is fairly well eliminated, although it is carried on still in some places; not in the Navy, I do not think, as much as in the commercial stations; but there is still some illegal carrying on of conversations.

Mr. GREENE. Of course the men in private business, the ordinary citizens, do not look upon the men in the Army or Navy as being supreme; whereas the men in the Army and Navy think they are; and it is natural, because they are trained to it. I realize that. But, too, the individual claims some rights as an individual.

Lieut. HOOPER. Yes, sir. The idea is merely to have the thing in one command, where a proper decision can be made in case of emergency, and that is not the case now. If you have all naval stations and all under one set of rules and all governed from one head office, things will be regulated so that in an emergency they will know who is to take control and the operators will respect that control. If you have two sets of stations, one of the commercial concerns and the other of the Navy, each will have its own rules, and in time of emergency each will try to take control, naturally. You can not have anything else, no matter what rules will be made. The matter is very unsatisfactory now.

On Cape Cod we have a station. I visited there some time back and about 9 or 10 in the evening the operator took his phones off and said he could not hear anything because rival stations near by

were sending out their "press." He was unable to operate, unable to listen on the ordinary ship's wave lengths, because "press" was being sent out by this commercial station on a considerably longer wave length. Scientists will explain to you that that can all be tuned out; that there should be no interference there. It can be tuned out by the scientists by a set of delicate instruments which we can not take aboard ship, and we can not hire civilians to use such apparatus on the ships. It would be absolutely impracticable. All we can do is to try to hire good men, and we employ good operators.

The CHAIRMAN. You could not put a scientist on each ship?

Lieut. HOOPER. We could not put a scientist on each ship, and if we could, they would not be of any use anyway, because they would not be any good except as scientists.

The CHAIRMAN. And they would not be of any use, anyway, as operators?

Lieut. HOOPER. No, sir.

(Thereupon, at 12:45 o'clock p. m., the committee adjourned until to-morrow, Tuesday, January 16, 1917, at 10 o'clock a. m.)

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HOUSE OF REPRESENTATIVES,  
COMMITTEE ON THE MERCHANT MARINE AND FISHERIES,  
Washington, D. C., January 16, 1917.

The committee reconvened at 10 o'clock a. m., Hon. Joshua W. Alexander (chairman) presiding.

The CHAIRMAN. You may continue your testimony now, Lieutenant.

**STATEMENT OF LIEUT. S. C. HOOPER, U. S. NAVY—Continued.**

Lieut. HOOPER. When I left off we were talking about the interference between the different stations and ships, as it exists under the present conditions. I was giving different examples of interference to illustrate the condition. The last was Cape Cod, where the Navy has a radio station at Highland Lights, about 15 or 20 miles from the Marconi station on Cape Cod, at South Wellfleet. I was in the naval station one evening when the operator on watch took off his phones, with which he was receiving, and I asked him why he had done that. He said he could not receive at the same time the Marconi station was sending their "press." I listened in myself and found it was impossible to receive the ordinary ships on the ship's wave length, even though there was a great difference between the wave length used by the ships and that used by the Marconi station which was sending out "press." That illustrates the difficulty that exists when one station is attempting to receive faint signals at the same time that another station, even though with a widely different wave length, is sending 15 or 20 miles away, on high power.

Mr. BURKE. How far apart were those stations?

Lieut. HOOPER. Somewhere between 10 and 20 miles, I should say. I am not familiar with the exact distance.

We have the same thing in our Fire Island station, New York, which I should say is about 10 miles from the high-power station at Say-

ville, belonging to German interests. When Sayville is sending, Fire Island has great difficulty in receiving from ships on short wave lengths, although Sayville may be working on a much higher wave length and with very efficient apparatus, due to the fact we can not get away from the high-power stations on a short wave length. We could probably tune Sayville out ordinarily at Fire Island, if we had a very skillful scientist there to do it; but the poor operators can not do it. We have just as good operators as anybody; in fact, a good deal better than any other company in this country. Our apparatus is far superior to any commercial concern. I have seen the commercial stations, most of them, and have seen most Navy stations, and I should say on the average the Navy apparatus was at least twice or maybe four times as good as the commercial apparatus for ordinary ship and ordinary commercial stations. The expense we go to, in the Navy, to build good stations—and we get all of the latest and finest apparatus—is far greater than is possible for the commercial people. Of course, there are the few exceptions of the high-powered stations, where the commercial companies go to the greatest expense to equip their stations with the finest apparatus; but the ordinary coastal stations of the Navy are far superior; and for ships there is no comparison at all. The Navy apparatus on ships is far, far superior to what is found on merchant ships.

There are two commercial stations operating between Philadelphia and New York which have always been the cause of contention—the Wanamaker stores in Philadelphia and New York. They exchange messages all day long. They are commercial stations, and cause a great deal of interference, which is a bad thing and should not be allowed. It is contended they use wave lengths which should not interfere with ship-to-shore work, but practically this is not true, as I have had the experience, as radio officer of the Atlantic Fleet and actually operating between different ships of the fleet, have had an opportunity of seeing what the actual conditions were; and I had many occasions to be interfered with by the Wanamaker stores.

The CHAIRMAN. What is the occasion for them to use this apparatus—just advertising purposes?

Lieut. HOOPER. Either for advertising purposes, or else it is cheaper for them to exchange messages by radio than it is by telegraph. They have so many messages to exchange between those two stores, about shipments back and forth between New York and Philadelphia, that they use this direct means of communication instead of using the ordinary telegraph.

The CHAIRMAN. Is it less expensive for them to maintain their stations in New York and Philadelphia and have their own private operators than it would be to use the commercial stations?

Lieut. HOOPER. I would not be able to state that, sir; but I think it is about an even break. I think they like the idea of having direct radio communication between their stores.

Mr. HADLEY. Do you know how the cost of communication in this way compares with the cost of communication in the ordinary commercial way? I realize that is rather collateral to this inquiry.

The CHAIRMAN. Yes. What is the reason for their maintaining that service when they are aware it interferes with ship-to-shore service?

Lieut. HOOPER. I think, sir, they do it more because they like the idea. They are a very rich company, and, whether it costs more or less, they would probably continue it. I am not able to state what the relative costs would be.

Mr. ROWE. You said there was still another commercial company, besides the Wanamaker, between Philadelphia and New York; who is that?

Lieut. HOOPER. I do not understand that I mentioned any other commercial company.

Mr. ROWE. I thought you said there were two companies between New York and Philadelphia that interfered with the ship-to-shore communication.

Lieut. HOOPER. No, sir. The Navy used to work between Philadelphia and New York, and we found we were interfering, too, so we stopped our work between these points; but this other work continues.

Mr. BURKE. Let me inquire right there: If this bill becomes a law, is it contemplated that the Government shall take over that wireless system between the Wanamaker stores in Philadelphia and in New York?

Lieut. HOOPER. I think Capt. Todd will have to answer that question.

These conditions of interference exist also on the west coast. San Francisco is a great center of interference. They have a high-powered station at Bolinas belonging to the Marconi Co. which is equipped with a very high power radio transmitting set for operating with Hawaii. When this set is sending, although on a very long wave length, its interference is such that for 50 miles around all the stations in the vicinity are put out of business or their efficiency in receiving greatly reduced. Our station on the Farallon Islands, off San Francisco, I imagine, is 30 or 40 miles from Bolinas. It complains frequently of difficulty in receiving the faint sounds from the ships—and the Farallon station exists for the benefit of shipping—because of this interference from Bolinas. The wave length of Bolinas is something like 6,000 meters, and Farallon is down to something like six or eight hundred meters. There is a very wide difference in wave lengths, and yet, in fact, the interference from Bolinas is very serious, and the ships trying to send and operate with Farallon station can not get their messages through at times. There are also other stations around San Francisco which cause interference. It is a very serious condition there, and it is an example of one of the many places where this condition has grown up and is getting worse. There will be no end to it if it is allowed to go on. It is nothing now as compared with what it will be 20 or 50 years from now. Then nobody will be able to get anything through if the stations are allowed to be erected, as they are now, without restriction.

The radio art is in its infancy now and there are a few big stations, but if they are allowed to go on increasing in number nobody will be able to work at all. It is something you can not see, and therefore you do not realize the conditions that exist. If you saw two trains trying to pass each other on the same track you would not permit it; it would be stopped right away. This is a similar

condition; but you do not see it and therefore the seriousness of it does not dawn on you.

In Hawaii is a condition far more serious. The Federal Telegraph Co. has a high-power station there and the Marconi Co. has a high-power station there, and the Navy is building a high-power station also—all on one island. We expect to have very great interference on this little island when we get those three stations going. It will be a very serious condition for all; and it seems too bad that either the Navy or any commercial company should be placed in such a position, that they should be allowed to spend a million dollars on a station and then perhaps not be able to operate it effectively because of interference. We are equipped with apparatus which is the best there is, in endeavoring to operate our stations selectively, so that this interference can be cut out or reduced, and we have as good operators as any; and yet, in practical operation, the present law is entirely unsatisfactory. I imagine that the opponents of this bill will say that we have lots of defects in our operation and will claim that our operators are not as good as commercial operators; but I am able to state that the Navy operators are as good as commercial operators, and, in many cases, better. We have some poor operators and they have some poor operators, and in every matter there is criticism on both sides; but, on the whole, I think ours are better than the commercial operators. I do not mean to say that their operators are not good, but we give our men certain advantages which I do not think the commercial operators have, and we get somewhat better results.

I have in mind a case where, as a courtesy, we put one of our radio sets on one of the colliers operating on the Atlantic coast, because this collier was unable to obtain a commercial set before sailing. The company that owned the steamer claimed that the apparatus was not any good. It developed that the commercial company that supplied the operator to this ship had supplied a man who was not good enough to work the apparatus that we use; ours is so much better, and necessarily more complicated, due to its increased selectivity and other features. This operator could not make the best out of it; and he stated he only got \$20 a month, and it was not worth his time to learn all these things. We can require our men to learn all of these things.

I only give that as an example to show that the commercial operators are not perfect any more than anybody else. We have men who do not carry out the regulations at all times, and so have the commercial people. I have no doubt we could spend all day giving examples of each other's faults; but that would be entirely beside the question. We are both trying to do the best we can.

The CHAIRMAN. We will suspend now and the committee will go into executive session.

(At the conclusion of the executive session the committee adjourned until to-morrow, Wednesday, January 17, 1917, at 10 o'clock a. m.)

COMMITTEE ON THE MERCHANT MARINE AND FISHERIES,  
 HOUSE OF REPRESENTATIVES,  
*Wednesday, January 17, 1917.*

The committee reconvened at 10 o'clock a. m., Hon. Joshua W. Alexander (chairman) presiding.

The CHAIRMAN. You may proceed, Commander Todd.

Commander Todd. Mr. Chairman, Lieut. Commander Hooper has been ordered away from the city and we will not be able to have him here again. I spent some time with him yesterday afternoon and found out what part of his very important statement had not been given, and I am prepared to cover anything that has not been covered by him or will not be covered by two gentlemen that I have here this morning. The principal point is the question of the Government's monopoly and ownership of stations retarding the art.

The CHAIRMAN. Did Lieut. Hooper leave a memorandum which he wanted to have put in the record?

Commander Todd. No, sir. We talked it over and I took notes which I have here.

The CHAIRMAN. Very well, proceed.

Mr. GREENE. With whom was that conversation?

Commander Todd. The officer you had testifying yesterday. To show the Navy Department's anxiety to get out of the art the best there is in it, we have had in our employ since 1908 a scientist of high order and of high standing in the scientific world, who has done nothing but work on the higher aspects of radiotelegraphy for the benefit of the Navy Department, and, therefore, for the Government, during all those years since 1908—Dr. Austin, sir.

**STATEMENT OF DR. L. W. AUSTIN, EXPERT IN RADIOTELEGRAPHY  
 FOR THE NAVY DEPARTMENT.**

The CHAIRMAN. Give the committee your name, please.

Dr. AUSTIN. L. W. Austin.

The CHAIRMAN. What is your connection with the Navy Department?

Dr. AUSTIN. I am the expert in radiotelegraphy for the Navy Department.

The CHAIRMAN. You are a civilian?

Dr. AUSTIN. I am a civilian; yes, sir.

The CHAIRMAN. What were your former connections before you became an expert for the Navy Department?

Dr. AUSTIN. I was working for a number of years as a guest at the Bureau of Standards. Before that—do you want me to go back of that?

The CHAIRMAN. Yes; so that we will know something about it.

Dr. AUSTIN. I was at one time assistant professor of physics at the University of Wisconsin, and afterwards I was abroad for some study and work. Then I was at the Bureau of Standards as a guest, and during that time I did some special work for the National Electric Signaling Co. That was the beginning of my work in wireless, in 1905. Then, since 1908, I have been in my present position in the Navy Department.

The CHAIRMAN. Proceed.

Dr. AUSTIN. Since I have been connected with wireless telegraphy, of course I have watched the progress of the art with great interest, and the points which I wish to bring out this morning are regarding the nature of the progress which has taken place since the early days. The greater part of the advance which has taken place since, we will say, 1908, has been along the line of the high-power stations, which are stations using high-power machines. Small apparatus, such as is used in the ordinary wireless station, has not changed to any great extent. The very best apparatus which was used in 1908 is practically as good as that used to-day in the corresponding stations, as far as sharpness of tuning and freedom from interference is concerned, which I understand are the chief points of interest in regard to the Government's control of the stations. Of course at that time the average of the apparatus which was being used in the various stations was not as good as it is to-day. The general average has been raised. But the best that was known at that time was practically as good as that we have now. This improvement in the general average of apparatus and general freedom from interference has been most marked since 1912, and I believe it is more due to Government regulation and the requirements which the Government has made with regard to the apparatus and methods of working, than to general progress of invention.

The CHAIRMAN. That is since the enactment of the original radio law?

Dr. AUSTIN. I beg your pardon?

The CHAIRMAN. I say that is since the original radio law was enacted, of which this is an amendment.

Dr. AUSTIN. Yes. Of course it was claimed at that time that Government control would interfere with the progress of the art.

The CHAIRMAN. Oh, yes; these people were here and fought the bill at every point, claiming that it would destroy the art and its development, and in every other way.

Dr. AUSTIN. Yes. They made the claim that if they were left to themselves they would solve this problem of interference; but of course we all know it has not been solved; and that it is only by regulation and control by one central body that successful working can be carried on. And a more complete control would, in my opinion, give even better conditions of working than those which we have to-day.

The Government itself has done a great deal for the advancement of the art in a technical sense, as well as in the way of control. At the Bureau of Standards three laboratories have been established by the Departments of Commerce, War, and Navy, all of which are housed at the Bureau of Standards. The Navy and War laboratories, of course, are there by the courtesy of the bureau, while the Commerce laboratory belongs there. And from these laboratories a good many devices have come out which have proven useful in the art and special progress has been made along the line of measurements—the measurements which are required for high frequency work. Prof. Rosa, who is Assistant Director of the Bureau of Standards, I know holds that a more complete Government control will be to the advantage of the art; will be a help rather than a detriment. I think I may also say that the Government radio stations,

high power, the ordinary coastal type, and the ship stations, are **all** of them of a higher average than those of any single private company.

I think that is all I have to say.

The CHAIRMAN. You say a higher average; where does the Navy get its supplies and equipment?

Dr. AUSTIN. It buys from the private companies.

The CHAIRMAN. It selects the best?

Dr. AUSTIN. It selects the best; and it makes its own specifications.

The CHAIRMAN. And if the Government should gain the control that it would have under this bill should it be enacted into law, it would not limit the activities of the manufacturers of those appliances, would it; but it would create a stimulus to the further development of the art, because the demand would not be diminished?

Dr. AUSTIN. I do not think that it would. I think the conditions would remain practically the same.

Mr. HARDY. Except in one respect. Should there be no restraint on private companies there might be many useless installations of wireless which would all call for plants?

Dr. AUSTIN. Yes.

Mr. HARDY. Whereas with Government ownership and control there might be fewer stations and therefore a less amount of manufacture of those articles?

Dr. AUSTIN. Yes; that is possible.

The CHAIRMAN. There are duplications in a certain area now, but if the art were logically developed there would be more stations, wouldn't there?

Dr. AUSTIN. Oh, there would undoubtedly be a constant growth, so that in a few years from now there would be a good many more stations than we now have, even though we should do away with a good many which are considered useless.

The CHAIRMAN. The distribution would be more reasonable and more in harmony with the proper development of the art; the commercial as well as the military and naval requirements of those stations?

Dr. AUSTIN. Yes.

The CHAIRMAN. Are there any further questions from this gentleman? If not, who will you have heard next?

Commander TODD. Mr. George H. Clark, sir. While he does not call himself a scientist, he is a technical man of the highest grade—a practical man—who has been connected with the subject of wireless telegraphy since the very earliest stages, and especially with this subject of noninterference and tuning. He knows the first successful attempts with that and has a very intimate knowledge of naval and commercial apparatus.

#### STATEMENT OF MR. GEORGE H. CLARK, EXPERT AID FOR THE BUREAU OF STEAM ENGINEERING, NAVY DEPARTMENT.

The CHAIRMAN. Are you connected with the Navy Department?

Mr. CLARK. I am a civilian employee of the Navy Department and expert aid for the Bureau of Steam Engineering of that department.

The CHAIRMAN. How long have you been in that employ?

Mr. CLARK. I have been with the Navy Department at Washington since 1908.

The CHAIRMAN. And prior to that, were you a student of this art?

Mr. CLARK. After my graduation from college, in 1903, I was in the employ of the Stone Telephone & Telegraph Co., of Boston, as one of the engineers, and studied with that company until I went with the Navy Department.

The CHAIRMAN. Of what college are you a graduate?

Mr. CLARK. The Massachusetts Institute of Technology, of Boston.

The CHAIRMAN. Proceed.

Mr. CLARK. Since I have been with the Navy Department at Washington I have been assisting, as technical assistant, to the Bureau of Steam Engineering, with regard to the specifications under which we purchase apparatus, the purchase and testing of the apparatus from the commercial companies; and for the last few years in connection with the research work which has been done within the Navy itself. And I have been very fortunate to have thereby gained complete information on the technical side of the Government activities, both as to purchase and design within the Navy. As far as I have been able to observe, any question of the Government stifling the development is absolutely the opposite of the truth; because the policy which I have noted is that the Government has always wished to have mutual cooperation between the companies, which is, apparently, quite different from the line which has been followed by the companies as against the Government. The companies are better fitted for research work on details of apparatus, although the Government also has entered on this field and has made certain developments and certain inventions in its own lines. But, in general, the policy of the Government has been to improve apparatus developed by the commercial companies and to revise it so as to make it more fully applicable to military purposes; and in almost every case it has required a great deal of revision in order to make it fit for the more rigid uses which such apparatus gets on board ships and at the shore stations of the Navy. In making the apparatus more rigid—more fool proof, is the phrase we usually use—I think the Government has set a standard for the commercial companies, and I have noticed in late years they have been following that standard very largely, and it has improved their equipment and made their apparatus more standard throughout.

On the question, however, as to the broad features of radio-telegraphy, as to what systems should be used, and what type of apparatus should be discarded, and large questions of that character, I think that the Government has always been in the lead. A commercial company has to have a system working for some time, at least until the apparatus pays for itself. It could not discard its apparatus every time anything new came out in the art. On the other hand, the Government has discarded apparatus as soon as anything even slightly better is found in order to keep ahead of foreign powers. And this, positively, has been the point of view that the Navy Department has followed—at least as much as I know of it.

The CHAIRMAN. Do you find that is the policy of foreign Governments—whenever there is any improvement—to discard the old apparatus and install the new?

Mr. CLARK. I have had no opportunity to observe that to any extent. The slight observation I have had shows we are ahead of some of the foreign Governments in that point of view; but my experience has been limited as to the practice of foreign Governments. I know we are ahead of some Governments.

We can take several examples of what the Navy has done in keeping ahead of the art. We had at one time the highest-powered station in the world at Arlington. We had a \$100,000 plant there which worked excellently—a spark set. It was found, when one of the commercial companies brought some apparatus to us, that there was a better apparatus for high-power work—the so-called arc apparatus. The Government thereupon sent one of its cruisers on a trip across the Atlantic to determine definitely, from a scientific point of view, whether the arc set was better than the spark set, and also from a practical point of view whether it was better or not; that is, whether the operators could handle it more expeditiously, whether it could work better in storms, and from all points of view. I was very fortunate to be on the ship at that time. We gained a great deal of information both practical and technical. That trip, of course, cost a great deal of money. No private concern could have afforded to detail a large ship expressly for such a purpose.

The ship was under the complete control of the Arlington Station and made the voyage in accordance with the orders from the main station, so that the test was a scientific test, and that was the whole object of the trip.

Having determined from that trip that the arc set was best suited for high-power stations, all the high-power stations which we now have are of the arc type, and we have discarded, except for breakdown service, the spark set at Arlington, although by no means obsolete, and put the arc set in. The results have more than justified that change and the taking out of the spark sets, in that the chain of high-power stations are now working and working exceedingly well. The high-power stations of other companies, with the exception of one company which supplies this type of apparatus, the arc type, still stick to the spark type. At the present time we have a high-power station at San Diego, which is just going into commission and which has been under test for a few days and has been shown to be an exceedingly powerful station; in fact, it far exceeds our specifications and even our hopes in that respect.

In regard to other developments which the Navy has fostered. I may speak about the oscillating audion for the receiving of signals. It is a new method of receiving signals which supplants the older method, although the older method is still in use to some extent. This new method was first taken up and helped along by the Navy Department. As soon as that method was brought to our attention it was tested, under control of Dr. Austin, of the Bureau of Standards, and found to be a very excellent method of receiving signals and much more effective than the former method.

The CHAIRMAN. What was the former method?

Mr. CLARK. The former method made use, in general, of a crystal detector by placing two plain crystals up against each other. This oscillating audion consists of a bulb, an electric light, practically, with a number of other features inside the globe, and special control

features. It was invented by a commercial company and developed by it and then brought to our attention. Since it was brought to our attention it has been adopted at a large number of places, and we have bought hundreds and hundreds of outfits. It costs very much more than the previous outfits. The detector itself costs somewhere around \$200, and each electric-light bulb renewal costs somewhere around \$10, whereas the entire crystal detector which it has replaced costs somewhere around \$15. Although the cost is very much greater, on the other hand the advantages are very much greater.

The CHAIRMAN. What is the advantage of this device?

Mr. CLARK. By the use of this device we have been able to cover very much greater distances with the same power of transmitter. The chief advantage is it is much more sensitive. Another advantage is it enables messages to be caught during a severe storm, severe interference, which with other types of detector would prevent the reception of messages. It has made our service much more efficient.

A similar development has been made in the spark-set apparatus, with regard to the adoption of the mica transmitting condenser. The former condenser used in our spark sets consisted of a glass jar coated on the inside and on the outside with copper, and of course it was very breakable. A firm brought to the Navy Department's attention the advantages of a type of condenser which they had developed, which was sealed in a metal container that could not be broken. It was very much smaller than the previous type and had slight electrical advantages. We gave this condenser a very thorough test and decided it was desirable to standardize on it, and we have done so and placed a large order. The cost of that condenser is very much greater than the previous one, but it has so very marked advantages we feel justified in making the change. And I note now the commercial companies are beginning to adopt condensers of the same type, in that the apparatus they are now supplying to the Navy Department has this condenser in it.

Mr. HARDY. That would be natural anyhow, if they knew you required it?

Mr. CLARK. They can supply any type they wish.

Mr. HARDY. But they know the Navy Department does not want any except that particular kind.

Mr. CLARK. We do not specify any particular kind. Of course, as you say, they realize it would be better to supply the apparatus we prefer to have.

The CHAIRMAN. You mean that under your contract they could furnish the other style?

Mr. CLARK. Yes; under the contract they could furnish either style.

Mr. HARDY. But you would hardly buy one which you considered defective?

Mr. CLARK. We would not care to.

Mr. HARDY. Consequently they want to furnish you with the one they know you want, which is this later type?

Mr. CLARK. Yes; I suppose that is the case. I do not know whether this condenser has been adopted by the commercial stations or not. It has not been on the market sufficiently long to be adopted, I think.

When the question came up of adopting the arc set for high-power stations, the Navy Department realized that it was taking a step in advance and of course there were certain elements of doubt about it. But the experiments carried on on the *Salem* seemed to indicate we were making a good resolve, and experience has shown that we did so.

The next step, which is coming in the very near future, is in making use of a similar apparatus in the very low-power stations, for the small sets for ships, aeroplanes, and so forth.

The peculiar features of the arc set as against the spark set have shown up very well in high-power work and we have now practically decided that the same type of oscillations, generated in a different way, will be used for low-power work. This has not been adopted by commercial companies as yet. We have bought a number of pieces of apparatus of that type for low-power work, aeroplane work, and small-set work, and we are fostering that to the utmost extent because we feel continuous oscillations, as they are called, will be much better for low-power work. That is a step we are taking at the present time which again we think will be a step in the advance of the art. In a recent test at the Washington Navy Yard we found that we could cover twice the distance with this new set than with the former, and hence we are slowly but surely tending toward the use of such apparatus.

Mr. HARDY. What is the weight of the new type of apparatus?

Mr. CLARK. The weight of the sets I tested was about 150 pounds in each case. The spark set, of which we have a great number in the service now, was of that weight, and this new type was also of the same weight. It was intended to be used in field work, where a maximum distance for a minimum weight is the requirement we are trying to fulfill, as the sets must be carried.

Mr. HARDY. That is for use on the aeroplanes?

Mr. CLARK. This particular set was for use in field work, for companies to communicate with each other in the field. The same type of apparatus has been purchased for use on aeroplanes, where the question of weight is again of vital importance.

In regard to the research work which the Navy is carrying on to supplement and assist commercial development, I may mention that we have now 14 civilian engineers, practically in all of the large navy yards, and with all the manufacturing facilities of each yard back of each engineer. Each yard is assigned a certain specialty in radio apparatus, which in general is the specialty of the expert assigned to that yard. Development work, and to a slight extent manufacturing work, is carried on. The Washington yard, with which I was connected for some time has developed receivers that in every case compare favorably with commercial receivers which we purchase from the outside. On last year's order, the navy receiver, the type developed at the Washington Navy Yard, was better than any commercial receiver. On this year's order one commercial receiver beat the Navy receiver. And that is the tendency, to seesaw from one to the other. Every development the Navy has made in receivers has been given to the commercial companies to the fullest extent, and the greatest cooperation has been allowed. And I think it has been mutual. We have received just

as many, if not more, suggestions from the commercial people. And I think, as a result, it has tended to a standard form of receiver. The chief advance has been in the method of control, so that the operator going from one station to another knows just how to operate the receiver; the new set looks like the one he worked with at the last station. And that is a great point that has been brought out, because of the method of operation is the same, the operator feels at once he is familiar with the device and he goes to work at once without any false moves; and in so standardizing the receiving apparatus of the sets, we have decreased greatly the difficulties of receiving. All the commercial companies now supplying sets to the department, make use of our Navy control method, and from the outside of the receiver it would be difficult to tell just who made the set.

Another matter of mutual cooperation is that in our method of making the specifications under which we buy our apparatus. Before drawing up the requirements we send to all of our civilian assistants in the Navy and ask them to comment on their specialties; we send to all the officers in charge of ship and shore stations that use that apparatus and ask them what defects they have found in the apparatus they have been using in the past. Then we send to all the commercial companies who are manufacturing companies and we get them to submit their ideas and ask them to comment on our specifications. We also ask the electrical manufacturing companies for comment; the General Electric, the Westinghouse, and the Cutler-Hammer may be mentioned. They recently sent representatives to Washington who spent several days going over the specifications for motors and generators and we received a great deal of valuable information from their exhaustive experience in the manufacturing line. Then, after all this information is gained, we call for a set which is the product of the highest practical engineering talent, and as a result our sets are of the very best. That is absolutely the result of cooperation, part of which is due to the Navy and the greater part of which is due to the various commercial companies.

In regard to new developments in radio engineering, I do not quite see where there is any question of the Government stifling development. In the eight years I have been in Washington we have been constantly conferring with all the radio companies and all radio engineers on new developments. Whenever they get a good idea, even though it is merely on paper, I have noticed they always come to Washington and bring it to our attention. And in every case, if it shows a possibility of working, we ask them to make a test and show us the result of the test; and we offer them, as we almost always do, the use of a navy yard to set the apparatus up and demonstrate it. We are carrying on every day tests of something of that kind and reports are coming to us daily. As a result of that we have obtained a number of very valuable inventions, particularly in the last two or three years, and we have adopted them and are installing them as fast as they are brought to our attention and are ready to be used in the work.

Another feature to which I may point with pride is the fact that every engineer whom I know feels he can trust the Government

to keep the details of his invention secret. I have not ever yet heard any complaint of any leak from the Navy Department in that respect. I may call attention to one special case, that of the Western Electric Co., which carried on new experiments in wireless telephony over here at Arlington for over a year before it was known on the outside. We were in constant touch with these experiments at the time, and no question whatever was raised of anyone finding out what was going on. On the other hand, any of our developments, any development of apparatus we should make in the navy yards, are not kept secret in any respect. We allow all the companies, on equal terms, to see what apparatus we have made and what the designs are, and we ask for the fullest criticism.

With regard to the wave-length regulations, I know the Navy was the first to fully make use of the range of wave lengths which are available in radiotelegraphy. We long ago recognized the necessity of being able to make use of the different wave lengths; and for two years we asked the companies to design apparatus which would change quickly from one wave length to another. It is not a simple thing, like turning a switch; it requires three or four or five different operations, and, if done individually, each operation by itself, would take some minutes to make the change. We wished apparatus which would enable us to change from one wave length to another immediately, but no company brought forth the apparatus and so it was developed and manufactured by the Navy Department itself. That apparatus is now in use in every naval station and in a large number of commercial stations; and by this means we are enabled to call a station on a certain fixed wave length, that every station knows—the calling wave—and then, having received the answer from the station, we can change to another wave length to send our message, that other wave length being the one best suited for the local conditions. We call on 950 meters, for example. The operator is always listening for a call on that wave, so he will not lose it. Having received an answer, if there is a lot of interference in that vicinity, he will change to a much longer wave and send his message. And that flexible system has been found to be very practicable and it has greatly improved communication by that means. That is one of the greatest developments that has been made, and shows the especial necessity for standardization and for unit control. By having the naval stations all under one head at Washington, we have been able to use that wave-length regulations sensibly, so that there is now very much less interference between naval stations than before that condition obtained. And for that reason, I think, it is one of the chief reasons why we desire to have all of the stations on the shore end under a similar control. If there was an individual ether for each message, like we can have an individual wire for each message, I myself would not feel there was a necessity for this; but as there is but the one single ether and every one has to use that, and since the methods of tuning, developing of sharpness of wave length, etc., have not kept abreast with the requirements of the art, the chief way in which to prevent kicks is to have everything under one control.

The CHAIRMAN. We are very much obliged to you.

**FURTHER STATEMENT OF COMMANDER DAVID W. TODD, UNITED STATES NAVY.**

Commander Todd. May I say a few words more to supplement what these gentlemen have said and to round out the statement Lieut. Hooper made yesterday before the committee? He has been ordered out of the city and can not appear before the committee again.

Mr. GREENE. How long before you expect to be ordered away?

Commander Todd. I do not expect to be ordered away for two and one-half years from now. Mr. Hooper has not been ordered to sea. He was ordered away temporarily on specially important duties.

Mr. GREENE. These changes are made so often, I did not know if there was anything in the wind.

Commander Todd. No, sir. Ordinarily, in my position, I would stay fully there years ashore. My predecessor stayed nearly four years, but that was very unusual.

Mr. GREENE. Would it not be possible, you having this matter in charge, to stay longer by special arrangement?

Commander Todd. It could be specially arranged, sir; but it would jeopardize my career. I might make myself a sort of a radio scientist and a very poor naval officer. I must go to sea to learn my profession and to keep in the game, so to speak. We are all anxious to be known as sea-going officers, efficient on board ship above all else.

I still want to talk about the noninterference with the development of the art by the Navy Department activities. Although the art has advanced a great deal in the last 10 years, the advance has not been so great as to keep up with the standards set by the Navy Department. Whenever the art makes an advance the increased use of radio telegraphy offsets this advance. We have use for every single improvement that can be made. We always keep a little ahead of what the manufacturers can furnish; also of what the inventors can devise. The art's advance has been able, up to the present, to keep up only with what is absolutely necessary. Dr. Austin has said that the greatest advances have been made in the last four years, since we had radio regulation.

When we started out it may be said we were satisfied with the shorter wave lengths which are covered by the London and Berlin conventions. There is a special reservation of wave lengths between 600 and 1,600 meters. We did not ask for any more, but we have been compelled, as well as the commercial people, to extend into the higher wave lengths reaching up to 20,000 meters. That is partly, of course, to get away, both the commercial stations and ourselves, from one another and partly because we must have flexibility in our range of wave lengths in order to get away from the intentional interference of the ships of the enemy. The enemy, should we get into a war, will attempt to break up all of our communication by sending signals on the same wave lengths we use. Therefore we must have a wide range of wave lengths from which to choose, and methods for shifting from one to another every few signals, if necessary, and in that way to keep ahead of them. It is understood that some nations have elaborate arrangements for inter-

ferring, and they have arrangements by which they can, at the same time they are interfering, get through their own communications. All this has been studied. We are doing the same thing and trying to do it better.

Mr. GREENE. Do you keep in touch with foreign improvements? Commander Todd. Sir?

Mr. GREENE. Do you keep in touch with foreign improvements?

Commander Todd. Yes, sir; decidedly so. When this war commenced we sent an officer abroad, an expert operator. He was given exceptional facilities and, through his own tact and aggressiveness, he learned practically the entire system as far as one or two nations are concerned.

The system of purchasing apparatus, I should like to have the committee fully understand. Some of the companies opposed to this bill and this idea of Government ownership, are those who are profiting very largely from the encouragement the Navy has given them and the development of the manufacture of apparatus, in a very practical way, by purchasing it. We cooperate with their engineers as a whole and pick out certain ones to whom we give certain problems to develop. We buy from practically all the manufacturers of high-grade apparatus in the country—the Marconi Co., the Federal Co., Mr. Lowenstein, the Atlantic Communication Co., Mr. Simon, the National Electric Supply Co., the De Forest, the Radio Research Co., the Cutler-Hammer Co., the General Electric and the Western Electric, the Wireless Specialty Co., and the Wireless Improvement Co.

The CHAIRMAN. I have letters from some of those people favoring the provisions of the bill.

Commander Todd. Yes, sir. That is probably because they desire a more open market. They realize that the Navy Department will always buy in the market high-grade apparatus. They have the apparatus to sell, and so they want to favor us for the reason that we will have more stations and more need for apparatus if we get this complete control, especially the high-grade apparatus. We try in every way to develop these companies and to give them such work as their manufacturing facilities will stand.

Our principal sending sets for long-distance work, both for shore stations and ships, are known as arc sets, which we buy from the Federal Telegraph Co., the only company that can furnish satisfactory apparatus of that kind. The spark apparatus is for ships and coastal stations—we are at present buying two-thirds of it from the Marconi Co., and they are coming up to our specifications.

Mr. Clark touched on the question of calling in the engineers of these private concerns. These specifications are overhauled once a year, and the three stages of development of which we are taking advantage are these: First, we organize our service and decide what our future needs are. Once a year a board of all the officers of the Navy who have to do with radio telegraphy, either ashore or afloat, are gathered together, as far as practicable, and go over all the advances made in the past year and decide what may be possible during the coming year. With these requirements in view, after deciding on these, we have a conference with the radio engineers and manufacturing people and find out what they think they can do,

how many of these things they can make up, and then revise our specifications as a result of this conference. Then we advertise and buy in open competition, wherever a number of firms can supply the same thing without question. We require the firms to submit samples for test and buy the best apparatus offered.

If the art were in the hands of a commercial monopoly—could such a thing be obtained—the apparatus would be too greatly standardized. I am informed that the apparatus of the British Navy is suffering from this standardization and is far behind that of the Germans. We hear that it has developed since the war started along newer lines. It may be that they have suddenly thrown out a lot of apparatus and installed new; but there was too much standardization there before.

I now wish to touch on something that was asked me during the first day of my opportunity to address the committee—the question of whether or not the Navy Department pays royalties, and so on. I have since found out that we do take particular pains to remunerate inventive ability and genius for their efforts. The department has several contracts with prominent firms and individuals covering the purchase of apparatus and payment of royalties to those firms and individuals, which prove conclusively that we do not neglect that side of it and are perfectly fair whenever a business arrangement can be made; and right in there comes, possibly, a discussion of the patent situation. With special reference to one of the basic patents of radiotelegraphy known as "the four circuit patent." This is used practically in all radio apparatus, both transmitters and receivers, and the claims of various people so overlap and have resulted in so much controversy that the Navy Department was not able to decide whether or not those claims were extravagant or real or otherwise, and the courts have not been able to do so, either. It is still in the courts; and it is on that same patent that the Government is being sued. We have to have the apparatus; that is the principal consideration involved; and not being able to decide these rival claims, we have to buy the apparatus from whoever will furnish it, use it, and let the courts decide.

Mr. BURKE. The Government does not lose anything anyway, does it?

Commander TODD. No, sir; in that it gets the apparatus it requires.

Mr. BURKE. They have to pay a royalty just the same.

Commander TODD. The result is a delay in getting their money. They claim the Court of Claims is a very long-winded and sorry way of getting their money and reaping a reward for their patent rights; but that is beside the question with us. We must have the apparatus and are not patent attorneys.

Mr. GREENE. And how about paying for these stations, if we take them over. Would they not have to go to the Court of Claims for that?

Commander TODD. No, sir. My idea would be that Congress would provide for a board or commission to investigate the matter and decide what would be a fair valuation as called for in the bill. We should have some men who know radio apparatus, others who know the value of buildings, towers, masts, and wires; others who

know the values of land in various parts of the United States. It should be a combination of technical and commercial men. I should say such a commission might very well be headed by a Member of Congress, and on the commission should be one or more business men and civilians of standing.

Concerning what the Commissioner of Patents, Mr. Ewing, said the other day, he gave the impression that the Government was not a good developer, because it is not in competition with anybody. Mr. Clark has touched on that, and we must say very positively that we have the greatest competition. We are in competition with all of the navies of the world. We must, in every way possible, try to get a hold on new devices and get them into use before the foreign governments do.

The CHAIRMAN. I think that is very well illustrated in the naval program. They are all the while trying to build newer and different types of battleships, larger battleships, bigger guns, and guns of longer range. I wish they would standardize, so we could. The same principle is involved in the development of the wireless, I presume.

Commander Todd. The same principle, sir. We are trying to provide now larger ships, with increased radio facilities and increased power—increased speed, gun power, and ammunition-carrying capacity, and what not. We are trying to keep ahead of other nations. It is well known that with anything we try to keep to ourselves we succeed only to a limited extent. Our advantage is temporary. Eventually the other side gets it. Naturally, what we must strive for is to have at all times devices aboard ships that will give us an advantage over the ships of another nation, something it has not yet found out; and to that end we try to keep our arrangements secret by keeping visitors out of our radio rooms, for fear somebody with foreign affiliations will inform them of our improvements; and we have begun to keep them out of our high-power stations. Later on we may have to do the same thing, possibly, with the coast stations.

We have the keenest competition, and let me emphasize the fact that radio apparatus that is of peculiar value for military purposes is also very valuable for commercial purposes in the same ratio. Valuable special devices are generally applicable to high-grade apparatus only. The military requirements are always very far beyond the commercial, and efficient apparatus for possible use in war is bound to be far ahead of the commercial apparatus which is built to cover certain limited needs only.

Mr. GREENE. May I ask how the compensation which you pay in the Navy compares with what is paid by private corporations for similar service in radio work?

Commander Todd. The Government as a rule has to pay more for apparatus—

Mr. GREENE. Not apparatus—I mean for talent. If you needed talent, what is your method of determining the compensation? How do you arrive at that? Is it arrived at by the Secretary of the Navy or is some board created for that purpose?

Commander Todd. No, sir; Congress makes an appropriation. It authorizes a certain sum to pay for a technical expert of such and such a type. We have no difficulty in getting the personnel of the

high type that we need. The commercial expert staff is, in a way, a sort of a shifting population, in that the companies themselves, while stable, are subject to their ups and downs—changes—with the result that first this year and then the next year a good man leaves the commercial field for the Government's service. We have absorbed a number of valuable men from the commercial field—two of them sitting over there—in the Navy Department and the Department of Commerce.

Mr. HADLEY. Did you say the department has to pay more for apparatus than commercial concerns?

Commander Todd. Yes, sir; because our specifications are more rigid, and they naturally put on a higher price because the Treasury has to be satisfied in so many ways that this money has been properly expended from a certain appropriation, that they payment is a little bit slower than it might be otherwise. We ordinarily do pay more, but the result is a much higher grade of apparatus than would satisfy the commercial companies. We are always ahead of the art, always ahead of the commercial companies.

A few more words about high-power stations. In the construction of high-power stations the wave length is not a governing factor except to a small degree. There are but few wave lengths in comparison with the number of high-power stations which commercial stations would wish to put in, say, 10 years; and if we do not put a limit now it will be more difficult to do so in 10 years from now and there will be greater embarrassment to the private companies who will then have much larger investments at stake. The location of stations must be controlled, as well as the number of high-power stations. If the companies are allowed to put up such stations, they will erect them near our stations, without much consideration of the matter of interference; whereas if the Navy is allowed to handle this matter they will be built in accordance with a general working plan, which is the only way to coordinate this work and get the maximum results. I hope to have here two other officers of the Government to speak in favor of this bill and the extension recommended providing for the purchase of high-power stations, as well as coastal stations. One is Dr. Rosa, Assistant Director of the Bureau of Standards, a scientist of international reputation, and the other is a representative of the State Department, to speak on the political aspect of this question.

Since this radio energy goes out in the space and covers vast distances in these days, international boundaries are affected. We either affect foreign stations or communication with them, and the State Department is very strongly interested in the question of neutrality, in that all neutrality regulations are not established entirely by the Navy Department, but after close communion with the State Department. In conjunction with the State Department we are working on a plan for increasing the good feeling between the Republics of the Western Hemisphere by having a Pan American Congress on the radio situation. A joint high commission went around South America some time ago and offered to them the idea of having an international Pan American radio system which would provide for commercial working from one port of South America to another, and so on to the United States, through high-power stations. The idea

was approved. The matter is still open. The Congress has not yet been held, but they have all, or nearly all, expressed approval of the plan, and have designated who will attend when the time comes. Now the question is, Who is to provide the high-power service for this system?

The CHAIRMAN. That would depend on the convention, would it not?

Commander Todd. That would depend on the policy of the Government, sir.

The CHAIRMAN. I say it would depend on the developments of this conference, on the terms of the convention.

Commander Todd. No, sir; I would say it depends on the action of Congress in reference to this matter of Government control.

The CHAIRMAN. If the Governments of South America would take over and control all the stations, not only the shore stations, but the high-power stations, it would then become a more acute question whether or not our Government should go so far.

Commander Todd. Yes, sir. I see your point now. It would depend on whether they favored commercial high-power stations or intended to operate them themselves. If we allow a commercial company to furnish the North American station, there is one more station which is restricted before it comes into the world and which will still further restrict existing stations, Government and others; and looking forward to the Government's participation in this international working of high-power stations, the department is now preparing to erect in the center of the island of Porto Rico a high-power station of the first order which, in times of peace, we expect to use for communication with similar stations in South America; and should war come upon us this station would be of inestimable value in control of the fleet over the entire Atlantic and, incidentally, for the protection of the Panama Canal.

The CHAIRMAN. Is there any station, either Government or commercial, on the island of Porto Rico?

Commander Todd. Two stations, sir; one quite a good Government station, of what we call medium power, at San Juan, and one commercial station of much less interest, used only to communicate between two large sugar plantations, one in Santo Domingo, at Macoris, and the other at Guanica, P. R. San Juan and Guanica are the only stations in Porto Rico. This new station would be on high land, on a military road in the center of the island.

Mr. EDMONDS. By which one is the commercial work now handled?

Commander Todd. By both, sir.

Mr. EDMONDS. They both handle commercial work?

Commander Todd. Yes, sir. The Guanica station practically handles only matters in connection with the transportation of sugar from Santo Domingo to Porto Rico. It is principally for convenience in conducting their business, but I believe that they do handle commercial work.

Mr. EDMONDS. What radius do they have?

Commander Todd. With ships at sea, 150 or 200 miles, perhaps; and between the two shore stations I think the distance is greater. I can not verify that right now.

Mr. EDMONDS. Can they send commercial messages from Porto Rico here?

Commander Todd. Oh, no, sir; but we do.

Mr. EDMONDS. To Key West?

Commander Todd. The San Juan naval station does, by the use of arc apparatus.

Mr. EDMONDS. Then you virtually handle the commercial business there?

Commander Todd. Yes, sir; and we have been for four years, ever since the enactment of the present act, handling the commercial business with shipping there, as well as at Key West, Charleston, St. Augustine, Fla.—I will mention them all, if you wish.

Mr. EDMONDS. Is there much commercial business there?

Commander Todd. At San Juan, yes, sir; quite a lot, and a great deal at Key West. Key West, I should say, is almost our best station on account of the great volume of business it handles—there are so many ships that pass there. We manage to keep good operators there, they are among the most efficient we have. We are now making special arrangements to increase the possibilities of this station by installing what is known as distance control, or duplex working. That consists in taking the receiver of the radiostation to a distance and using it for receiving on special antennæ, with special wires, so as to get away from the immediate interference of the transmitter. That device, borrowed from commercial companies—there is no patent on it—is in use or rapidly being put in use at all the important naval stations. Arlington has it, as well as Boston, Charleston and others. I will be transgressing on this confidential organization, in a minute, which covers, substantially, an arrangement for working our stations to best advantage for the control of the fleet. At Key West, we are going to put this in primarily for commercial reasons. It enables the Key West Station to handle commercial work with distant stations—to send to them, and, at the same time, receive calls from merchant ships on which lower wave lengths, because the receiver has been removed to some distance from the transmitter. I should like to say that with the exception of one company—and there are a good many companies operating shore stations—none of them have taken up this idea which is not only being developed by the Navy, but developed into what promises to be a high state of perfection.

I have just a few words more to say. Mr. Clark spoke this morning of the opening of the San Diego (Cal.) Station. That has this distance-control feature, with very high steel towers that will stand any hurricane that blows and cost the Government \$300,000; and as Mr. Clark said, the preliminary tests are far beyond our expectations. It will be an extremely valuable link. The indications are that communication across the continent will be good at all times; but there is no use in that. The land wires are quite suitable for sending dispatches across the continent; and we have special Government rates, so that the cost is not high. What is this station to be used for? It is one of the high-power chain of stations for which Congress provided the money, to communicate especially with the Canal Zone and with Hawaii. Now here is a station with the best apparatus obtainable in the world, as far as we know, and the indications are that it is going to work with high efficiency, but will start work with a great handi-

cap. That station, when it does work, is going to limit the work of the commercial high-power stations in California, of which there are two. It is going to limit the work of the medium power commercial stations on the Pacific coast, of which there are three or four, to a lesser extent. It is going to limit the communications of the high-power stations in Hawaii.

There is a situation on the Pacific coast of considerable gravity, and the commercial companies' stations as well as the naval stations are requesting that some action be taken, by special board or otherwise, to straighten out the question of wave lengths again. Now, here comes another station to complicate the situation. It will be limited by the wave lengths in use. We can keep from interfering with our own stations, as they are all organized so as to keep from interfering with one another. We can shift our own wave lengths to a limited extent, but new ones suitable to the installations in the various stations are getting scarce. Fortunately this new high-power station can probably use long waves efficiently. In doing so it must choose one not in use, and slight changes by either commercial stations or ours will bother the others. At best we are dependent on the good will of our neighbors—and Hawaiian stations are also neighbors in this case.

Mr. HADLEY. Can you state where the commercial stations are on the coast? I would like to get a statement in the record where they are and what are the high-power stations.

Commander TODD. The high-power stations on the Pacific coast are two in number; one belonging to the Marconi Co., at Bolinas, Cal., just north of San Francisco, and the other is just south of San Francisco and belongs to the Federal Telegraph Co. The medium-power stations are: First, the Federal Telegraph Co.'s station at San Diego, Cal.; and there is one at Los Angeles, San Francisco, and one at Lents, Oreg. The Marconi Co. has medium-power stations at Astoria, Oreg., and one in Alaska at a place called Ketchikan. The Navy has medium-power stations at the Mare Island Navy Yard, at the Puget Sound Navy Yard, and at Cordova, Alaska. The last two stations, at Cordova, Alaska, and the Puget Sound Navy Yard, represent our latest attempts to cover successfully the War Department's military cables between Alaska and Seattle.

Mr. EDMONDS. Are there any private companies at Seattle and Tacoma, or up there on Puget Sound?

Commander TODD. Yes, sir; a Marconi station in Seattle, but it is not what you would call a medium power station; it is principally for communication with ships, although I believe it can communicate with commercial stations in Alaska.

Mr. HADLEY. You have only named one commercial station in Alaska, and one at Astoria, Oreg.; are they all?

Commander TODD. Yes, sir; all the medium power stations except our Cordova station. When you come to the low-power stations, there are quite a number.

Mr. HADLEY. Some on Puget Sound?

Commander TODD. Yes, sir; shall I name them all?

Mr. HADLEY. No; I am satisfied so far as I am concerned. I wanted to get a general idea of the whole field on the coast.

Commander TODD. Quite a number of low-power stations, practically coastal stations as defined by the language of this bill. They primarily communicate with ships, although they do communicate with one another at times.

Mr. EDMONDS. They do not reach out, the low-power stations, more than 400 or 500 miles, do they?

Commander TODD. That depends on the circumstances. Generally about 100 to 200 miles. The matter is very complicated. The signals reach out farther over the water than over the land, ordinarily; they reach much farther in winter than in summer, and ordinarily much farther at night than during the day; and in the middle of the winter there are at times what we call "freak nights," where the signals are heard over tremendous distances.

Mr. HADLEY. I think they reach vessels going from Alaska to Puget Sound to a considerable extent.

Commander TODD. I beg pardon?

Mr. HADLEY. I say I think they reach vessels going from Alaska to Puget Sound and handle a great deal of commercial business.

Commander TODD. They do handle a great deal.

Mr. HADLEY. I think there are some of the low-power stations that cover a considerable portion of that territory.

Commander TODD. The Navy covers all outside waters of Alaska, and the Marconi stations cover all interior waters up as far as Juneau, while between Alaska and Puget Sound are a number of Canadian Government stations. During the summer the salmon industries have quite a number of stations at their canneries. Speaking of those freak nights we hear sometimes of the most astounding long-distance work in intercepting the ordinary interchange of messages between one station and another; and the latest I have in mind is an operator in New South Wales, Australia, who sent to us certain matter intercepted which, by the call letters, indicated that this matter was sent by the Tuckerton Station here in New Jersey. We were able to identify for him satisfactorily parts of commercial messages transmitted by Sayville and Tuckerton to Germany. I can not give you the distance, but it is all of 10,000 miles.

The CHAIRMAN. Is there anything further?

Commander TODD. Just a few words more. The San Diego station, put up with all this expenditure of time and money and effort, is going to be limited from the outset in its usefulness to the Government. When the Hawaiian station is put up, that will be still further limited on account of the very close proximity of other stations, and we are going to interfere with them. We are going to reduce the hours during which they can work, and they ours. We are not going to be satisfied, of course, to have those stations fully manned and not handle any business at all just to keep them there waiting for a possible war. We can not do that. We have to handle at least the Navy business between Hawaii and California with the San Diego station, and later, between Hawaii and the Philippines. Besides the Navy Department business there is the War Department in the Philippines and Hawaii, and that of all other departments of the Government; and there is the insular government of the Philippines. If we were to try to restrict the Government work of these stations so as to allow the commercial

people to have, say, three-quarters of the time, or all except sometimes when they did not need to work, the insular government and all other interests in the Philippines would say, "We can not see the sense in our paying these high cable rates when the Government has this reliable means of communication. We have paid so much for it; it may mean a tremendous advantage in time of war, but this war business is very indefinite. In the meantime can we not get some use out of these stations?" The answer would be, "We can, if convenient to the commercial companies," unless you gentlemen will give us some relief. Science is advancing, but not fast enough. Now is the time, before the business interests of those companies develop to a greater extent than at present. They do not want to sell out; they see a great field ahead of them, or they think they do. We do not see it. We see only trouble in the future, more expense to the country, and inefficient working up to the time when Congress does take the action which we hope will result from our efforts at this time.

Mr. ROWE. Would the bill we have under consideration here eliminate the difficulty on the Pacific?

Commander TODD. No, sir; that would not in any way affect the situation except for the very mild little sentence saying that commercial stations, that is, those that communicate between fixed points, shall operate so as not to interfere with existing stations—or some such words.

Mr. HADLEY. Would it cover it if the commercial stations were taken over in the outlying island possessions?

Commander TODD. I did not understand the question, sir.

Mr. HADLEY. In line with that last question, I say, would this bill cover the Pacific situation if the commercial stations in the outlying possessions were all taken over under the bill, and the others were excepted?

Commander TODD. That would improve the receiving in the outlying possessions; but these communications are both ways. For instance, the California coast station could send to Hawaii, for example, and Hawaii could receive successfully if the interference were eliminated at that point, and Hawaii could send to Samoa and could send to Guam, and so on, and could send to the Philippines. All of that part of it would be all right; but as soon as Hawaii started to send back to the Pacific coast the possibilities would depend entirely on what arrangements we could make with the commercial companies or whether or not the commercial companies are working at the time. We, of course, could answer by cable.

Mr. HADLEY. What I mean more particularly is the elimination of the commercial stations on shore, on the Pacific coast, is not essential to the Navy's interest in the outlying possessions.

Commander TODD. It is very essential. We could send all the messages we pleased to the outlying possessions, and thereby interfere with the commercial people to some extent; but we could not get any information back with any assurance; we could not be assured of it unless restrictive regulations were made—not only restrictive on the commercial people, but on ourselves. Of course, the radio companies might find it unprofitable to operate only one end of the California-Hawaii commercial business.

**Mr. EDMONDS.** What, eventually, will be the outcome of the development of the wireless on the cable companies, whether you do it or whether it is done by commercial interests? Is it going to drive the cable companies out of business?

Commander Todd. No, sir; for this reason: The possibilities of radio communication are limited. We have no scientists who will tell us—I mean real scientists—that it will ever be possible to send any number of communications through the common ether at the same time; and while there will be some business for long-distance radiotelegraphy in competition with the cables, there will never be enough to drive the cables out of business if the cables are efficiently operated.

**Mr. EDMONDS.** It would strike me that it would be rather a bad state of affairs, considering the present development of wireless, to lose the cables; because it seems that the radio communication is so indefinite that you could never count on it as being a sure thing. And if it is going to drive the cables out of business, it would not be a very good thing to develop it to that extent.

Commander Todd. I can state positively—positively is a pretty strong word, perhaps—but I can state that the possibility of driving any cables except broken-down cables, poorly operated, out of business is very remote. Of course, the broken-down cables will either be driven out of business or they will have to put in efficient condition. Radiotelegraphy will result in an increased efficiency of the commercial cables, because as soon as one side or the other commences to fall down on the work, the traffic will go to the other, and, especially in view of the fact that the first cost of radio communication between two points is very much less than the first cost of a cable. Once laid, the cable is more reliable; it has been, up to date.

**The CHAIRMAN.** The service will be cheaper anyhow, the rate by cable, than by wireless?

Commander Todd. That has not adjusted itself yet, sir. At present commercial companies who are competing with cables think they are doing it very successfully.

**The CHAIRMAN.** In rates?

Commander Todd. In rates; yes, sir. They have reduced the rates materially and claim to be making money. That has yet to be shown, however. It is quite true that the Sayville and Tuckerton stations are now making considerable money; but the reason is there is no cable to Germany.

**The CHAIRMAN.** There is no secrecy about wireless communications, is there?

Commander Todd. No secrecy, unless—

**The CHAIRMAN.** Everybody can listen in and tell what the other fellow is talking about?

Commander Todd. Yes, sir; exactly.

**The CHAIRMAN.** For that reason, it seems to me, it never can put the cable or the telegraph out of business.

**Mr. EDMONDS.** The only thought I had, Mr. Chairman, was it might cripple them to such an extent that the cable companies would not pay and would be abandoned. That is the only thing. But they each seem to have a distinct field of their own at the present time.

The CHAIRMAN. There is a secrecy about cable communications or communications by telegraph that seems to be impossible now by wireless, and for that reason most of the confidential communications naturally would go by cable or by wire, unless you wanted everybody in the world to know what you were talking about.

Mr. EDMONDS. They can use the cipher, of course.

The CHAIRMAN. Yes, I know; but that is a very cumbersome way of doing business.

Mr. EDMONDS. I would like to ask Commander Todd another question. I do not want you to tell me anything that is considered as a secret by the Navy Department, but I would like to know whether these ordinary stations, the Marconi and others, could be used for the control of submarines and torpedoes, and so on, as they are talking of doing nowadays, through this invention that has been talked about recently.

Commander Todd. I can not talk much about that matter sir. As it happens—

Mr. EDMONDS. There has been recently quite a little publicity about those things, you know, and I am only talking from what I have read in the newspapers about the control of submarines and torpedoes by the wireless waves.

The CHAIRMAN. The John Hays Hammond, jr., experiments?

Mr. EDMONDS. Yes. I was wondering whether the same apparatus or character of station as the shore stations could be used for that purpose.

Commander Todd. I can answer that question. It does take special devices, but undoubtedly some of the apparatus in a shore station—I do not know how much—could be adapted to this purpose. Generally speaking, it takes a very special, high-grade type of apparatus to do this in Mr. Hammond's plant. When I said that some of the apparatus in the ordinary commercial station could be used, I was thinking more of the masts and the wires than the apparatus.

Mr. EDMONDS. The reason I ask you that is this: Would a shore station in the hands of an unfriendly operator be able to be used to handle an enemy's torpedo, or something like that, from the shore, with the apparatus they at present have on hand?

Commander Todd. No, sir. They would have to have very special devices. I can say this because it has been said and printed in hearings before some committee of Congress, that Mr. Hammond claims to have solved the question of noninterference, and experiments have shown that he has to some extent. The ordinary station could exercise no control over these torpedoes. We would have to have special transmitters and to know the inner workings of the torpedo-carrying motor boat to do it.

I think that is all I have to say.

The CHAIRMAN. I have some communications here from the various executive departments. Here is a communication from the Department of Commerce. I believe Mr. Chamberlain has already put that in the record. (See pp. 63-66.)

I also have a communication from the Treasury Department, which was read by Lieut. Waesche. (See pp. 70-72.)

Here is a communication from the Department of Labor. They had a representative on the committee which drafted this bill, and

this is a letter from the Secretary of Labor in reference to the bill now before the committee. If there is no objection, I will have it printed in the record.

(The letter above referred to is as follows:)

JANUARY 9, 1917.

Hon. JOSHUA W. ALEXANDER,  
*Committee on Merchant Marine and Fisheries,  
House of Representatives.*

MY DEAR CONGRESSMAN: I have the honor to acknowledge the receipt of your letter of the 23d ultimo in which you call attention to the bill (H. R. 1935) to regulate radio communication, a copy of which you inclose. You ask that I give your committee the benefit of such suggestions as I may care to make regarding the desirability of enacting the bill into law.

Taking the bill as a whole I regard it as a very desirable measure—one which is very much needed and which will go a long way toward remedying evils and difficulties which the experience so far had with radio communication has demonstrated to exist and to require some well-devised and comprehensive action on the part of the Federal Legislature.

When an interdepartmental committee was formed, something over a year ago, with the purpose of having a thorough study made of the problems which have arisen and which are likely to arise in connection with this recently developed method of electrical communication, and when selecting a representative of this department to serve upon that committee, I expressed the opinion that, in view of the fact that radio communication can not be confined to definite channels to which specific title could be conveyed to individuals or corporations, it ought to be owned and controlled by the Government. Soon after the interdepartmental committee met and organized it requested the heads of the various administrative departments to express a definite opinion as to whether the committee in carrying on its work should have in view the actual acquirement of all existing radio stations, or how far in that direction the bill which it was proposed to draw should go. To this communication I replied by restating the opinion which I had expressed at the outset in detailing a representative. The report submitted to this department by its representative after the committee had completed its labor, the results of which constitute the draft of the proposed measure now under consideration by your committee, shows that the said representative and those serving upon the committee as representatives of the military branches advocated throughout the deliberations of that body the ownership by the Government of the wireless telegraph; that the drafted measure, like all productions of its kind, in the formulation of which a number of individuals take part, is to a considerable extent in a number of its features the outcome of compromise between the members of the committee who entertained various views concerning this subject.

I have had no reason to change my mind on this very important question. Upon reading the report of the department's representative and considering the various provisions of the measure produced in the manner above described by the interdepartmental committee, I am more than ever convinced that Government ownership is the real solution of our radio communication problems. I observe that there are many provisions in the drafted bill that tend toward ultimate Government ownership; but I wish to direct attention to two provisions in particular, one of which I think logically constitutes an argument in favor of going further in that direction than the bill at present does, and the other of which I think should be materially changed in order to hasten the ownership by the Government of at least that part of the wireless telegraph business which it is of the greatest importance that the Government shall absolutely control, for reasons of a military, neutrality, and commercial nature.

It is provided in the next to the last paragraph of section 5 (p. 6, line 16, to p. 7, line 2) that in the Philippine Islands, in the Canal Zone, in certain United States territory in the West India Islands, and in a geographically defined section of the Pacific Ocean no private radio station shall hereafter be operated on land or on a permanently moored vessel. It is understood, of course, that this step toward Government monopoly can readily be taken because the field involved has been occupied quite completely with Government stations and that stations controlled as private enterprises have not been erected within such territory. But it seems to me that if it is sound upon principle to contend that the Government should have a monopoly of wireless telegraph in these par-

ticular sections, by the same token that system of electrical communication should be a Government monopoly elsewhere.

Section 6 of the proposed measure (p. 7, lines 7-13) I think would be very much improved if changed to read substantially as follows:

"Sec. 6. That after three months from the passage of this act the Government, through the Navy Department, shall have authority to acquire, by condemnation proceedings, any radio station now in operation in the United States."

Commending to the very careful consideration of your committee the suggestion made above, I beg to subscribe myself,

Very truly, yours,

W. B. WILSON, *Secretary*.

There is also a letter here from Franklin K. Lane, Secretary of the Interior. It is very short and approves of the purposes of the bill.

(The letter referred to is as follows:)

DECEMBER 29, 1916.

DEAR MR. ALEXANDER: Replying to your letter of December 23, requesting report upon H. R. 19850, a bill "To regulate radiocommunication," I have to advise you that this bill is in the form approved by the interdepartmental committee, which was organized for the purpose of considering this question and suggesting appropriate legislation.

The Interior Department is not directly concerned, but I approve of the object sought to be attained by the bill, and know of no reason why it should not be enacted.

Cordially, yours,

FRANKLIN K. LANE, *Secretary*.

There is also a letter from Secretary Baker, Secretary of War, which reads as follows:

WAR DEPARTMENT,  
Washington, January 18, 1917.

Hon. JOSHUA W. ALEXANDER,

*Chairman Committee on the Merchant Marine and Fisheries,  
House of Representatives.*

SIR: In reply to your letter of December 23, 1916, I beg leave to state that I consider the bill introduced by you on December 22, 1916, to regulate radiocommunication (H. R. 19850), a most important measure, and one that should be enacted into law as soon as possible.

I firmly believe that the provisions of this bill when enacted into law will prove of inestimable value to the Government by enabling it to regulate radiocommunication in a way which will increase the efficiency of both the Army and Navy in war or national emergency.

Yours, very truly,

NEWTON D. BAKER,  
*Secretary of War.*

The communication from the Postmaster General has already been put in the record by the chief clerk of that department, Mr. Denning, so we will not duplicate that. (See p. 96.)

Here is a communication from the Navy Department. I do not believe this has gone into the record.

Commander Todd. It has not, sir.

The CHAIRMAN. If there is no objection, that will also be incorporated in the record.

(The letter from the Secretary of the Navy is as follows:)

DECEMBER 29, 1916.

SIR: I have the honor to acknowledge the receipt of a copy of a bill to regulate radio communication (H. R. 2935), forwarded with your letter of December 23, 1916, requesting suggestions touching the merits of the bill and the propriety of its passage. The bill is an excellent and necessary measure, and the department approves it and recommends its passage, subject to the following remarks:

The Navy Department is the principal user and the most extensive buyer of radio apparatus in the United States. It has had the strongest influence in

**developing apparatus since the early days of the use of radiotelegraphy in this country by constantly requiring manufacturers to incorporate new ideas which the department has found necessary. In addition, from the operation of 51 stations, used for all purposes for which radio is suitable and necessary, the largest experience has been gained concerning the operative features of radio apparatus, and it is convinced that Government operation and control of all stations used for commercial purposes, other than those on board merchant ships, is necessary on account of the mutual interference between stations and for other reasons given below.**

This mutual interference between stations has always been a very serious question. Many inventors have been and are working on the problem and great improvements in apparatus and methods have resulted, but the number of installations and the consequent extension of radio communication have increased faster than science has increased its possibilities as regards non-interference, while the constantly increasing distances over which these communications take place increase the difficulty to a very great extent. The net result is that the number of communications that can take place at the same time in a given area is still limited. One station or system must wait for another to finish; there are many chances for disputes, which sometimes are carried on between operators by radio, especially when the operators are not under strict control, adding to the time wasted. There is needless duplication of effort, and in cases of distress the confusion resulting from many interests attempting to render aid, get news, or satisfy curiosity, is very dangerous. To permit the greatest amount of business, Government and commercial, being done through consistent changes in apparatus, through systematic apportionment of and prompt and frequent changes of wave lengths, and through standardized methods of operating, one management is necessary.

For other reasons, radiotelegraphy has been looked upon as a natural Government monopoly. Since only by the closest regulation can the best use of this art be obtained, not only for commerce and safety at sea, but for military purposes, radiotelegraphy is a strict Government monopoly with the larger number of foreign nations, and in these foreign countries where commercial stations are permitted the Government control is generally so strong as to amount to a monopoly.

The difficulties of maintaining the radio neutrality of the United States during the present war have been real, in spite of earnest attempts on the part of commercial radio companies to cooperate with the department. The possibilities of unneutral service by sending of messages from stations in the United States containing information of military value to one side or the other are very great, while commercial radio stations under other than Government control can give out information of incalculable value during that twilight period which would probably precede the opening of any war to which this country might be a party. Authority to take over and operate or to close commercial stations in time of war will not suffice. The stations must be in full Government operation before the first hint of possible hostilities. In this connection, since an alien operating on board an American ship to-day can perform unneutral service without the knowledge of the master which can result in the capture or sinking of the ship, I have to recommend that the words "except for the operation of a station on shipboard" in the fifteenth and sixteenth lines on page 14, be omitted. Provision should be made, however, for the temporary employment of an alien operator for service on an American ship in emergencies, but no American ship should be allowed, ordinarily, to leave a port of the United States except with operators who are United States citizens.

The prime necessity for efficient radio communication with the fleet and with outlying naval bases is apparent, and the only way that the Navy can be assured that this communication is ready and working at top-notch efficiency when hostilities are imminent, is to have these stations working constantly in times of peace. Only by constant use can stations and operators be kept efficient. It is invariably the case that the station that handle the most business by radio is the most efficient, and develops the best operators.

This necessity for military radio communication was recognized early and a system of naval stations on both coasts and at the principal outlying points belonging to the United States was established over 10 years ago through the liberality of Congress. This has been gradually extended to include more efficient service in the Canal Zone, in Alaska, in the Pacific, and on the Gulf of Mexico, by the addition of stations, and everywhere by continuous increase in efficiency and apparatus. Every new device has been tested as soon as practicable and put into use in the stations and on board ship. Since the Govern-

ment must have this system for its control of the fleet, and for other Government business, which includes communication with Army transports, Coast Guard vessels, lighthouse tenders, light ships, weather reports, storm warnings, time signal service, hydrographic information, and safety of life at sea, it is a needless duplication of capital and effort to permit private stations to operate where they can interfere with each other and with the military and other Government work of stations and where the Government stations can easily handle commercial work in times of peace; work that would be interrupted or partially suspended in time of war. Congress recognized this in 1912, in passing the radio act now in force, and since that time the department has been successfully handling commercial radio work at a number of its stations. At present there are 23 stations handling commercial work very successfully and efficiently, turning the receipts into the Treasury. The department has been looking forward to increasing its possibilities in this regard by installing distant control at certain points, which device enables a station to work with merchant ships and with naval ships, or distant radio stations at the same time. The department is ready and willing to take up all radio communication between ship and shore and any other necessary radio communication.

The idea of the Government ownership of all stations handling commercial business, except ship stations, is not a new one. A number of official reports have recommended it. As early as March 22, 1910, this department, in a letter to your committee wrote the following:

"This department, in connection with the War Department and the Department of Commerce and Labor, has for many years sought the enactment of legislation that would bring some sort of order out of the turbulent condition of radio communication, and while it would favor the passage of a law placing all of the wireless stations under the control of the Government, at the same time recognizes that such a law, passed at the present time, might not be acceptable to the people of this country. However, it is not at all certain that the commercial limitations of the art might not in the future impose such an obligation upon the Government."

It is noted that the bill looks forward to such ownership in several provisions, such as:

- (a) Excluding all but Government installations in certain localities where commercial radio stations have not been built.
- (b) Opening Government-owned stations to commercial business in competition with existing commercial stations.
- (c) Providing for the purchase of coastal stations which owners may desire to sell.

The bill covers the purchase of coastal stations only—that is, only those used to communicate with ships, and by permitting the Navy Department to open all of its stations to commercial business, discourages the extension of any existing commercial systems or the organization of new systems. The department strongly recommends that the committee provide for the purchase of all stations used for commercial purposes. Attention is invited to the increasing number of stations. In some cases the value of existing stations is constantly increasing, and decisive action at this time will result in a saving of the public funds.

In accordance with the above, I have to recommend that section 6 of the bill provides for the purchase through the Navy Department of all existing coastal and commercial stations in the United States, Alaska, Hawaii, Porto Rico, and the Swan Islands within two years at reasonable valuation and that no license be granted to any such station for operation after two years from the date of passage of the bill.

The other provisions of the bill, especially those pertaining to ownership, licensing, and control of stations by the Department of Commerce, are admirable and I heartily indorse them all. These provisions cover well the regulation of all stations other than those defined in section 2, first and third definitions, and should apply to these until they are acquired by the Government.

Firmly convinced that the above provisions are absolutely necessary for the best interests of the Nation, I do not hesitate to recommend that this matter be considered urgent. Delay will increase not only the difficulties under which we are now working, but the cost of providing the ultimate remedy.

Sincerely yours,

JOSEPHUS DANIELS.

Hon. T. W. ALEXANDER, M. C.,

*Chairman Committee on the Merchant Marine and Fisheries,  
House of Representatives.*

Then here is a letter from the Merritt & Chapman Derrick & Wrecking Co., which reads as follows.

NEW YORK, January 12, 1917.

**Hon. J. W. ALEXANDER,**

*Chairman Committee on the Merchant Marine and Fisheries,*

*House of Representatives.*

DEAR SIR: In reference to the bill now before your committee to regulate radio communication, we beg to strongly indorse this measure, as we believe it to be of great benefit to the merchant marine in general.

Yours, very respectfully,

MERRITT & CHAPMAN DERRICK & WRECKING CO.,

By J. T. MERRITT, President.

Also a communication from the American Radio Relay League, with headquarters at Hartford, Conn., which is signed by Hiram Percy Maxim, president. I can read it, if you wish, or simply incorporate it in the record.

Mr. EDMONDS. Is it indorsing the bill, or against it?

The CHAIRMAN. It says:

JANUARY 11, 1917.

**Judge J. W. ALEXANDER,**

*Chairman House Committee on the Merchant Marine and Fisheries.*

GENTLEMEN: At the hearing to-day on the radio bill it was evident that there would be no opportunity for me to be heard for some days, and as my business prohibits my remaining in Washington beyond to-day, I am compelled to submit in writing what I had hoped to be able to tell your committee in person.

The American Radio Relay League, of which I am president, is an organization of approximately 5,000 amateur radio station owners scattered in all the States of the Union. Our object is the perfection of radio relay routes by means of which messages may be sent between private citizens in any part of the country free from all charge. We have been in operation since May, 1914, and at present are handling between 100 and 500 relay messages every night. Some of our stations have handled over 40 messages in a single night. We are rapidly growing and improving our organization and I am justified in stating that in another two years' time, if no legislative obstructions prevent, we will be able to handle a large volume of traffic from the Atlantic to the Pacific coasts and from points over the border in Canada to points over the border in Mexico.

Our membership is not limited to young men, but an ever increasing number of men of affairs and of mature years are joining us in this work. I have considered carefully the proposed radio bill and I desire to go on record as approving those parts of it which concern amateurs, because I believe its enactment into law will reduce radio interference which is now the greatest difficulty which confronts us. I recognize that the proposed bill will confer greater powers upon the Navy Department, Department of Commerce, and upon the President in dealing with us amateurs; but I believe these greater powers will help our work rather than retard it. These authorities can not but appreciate that it is from the ranks of us so-called amateurs that the talent necessary to carry on both Government and commercial radio work is principally drawn; that we amateurs and the many manufacturers whom we support have already been the source of several valuable improvements in radio science, and that in time of public need our well-organized relay trunk lines and our very efficient stations in the various States of the Union might easily be of incalculable value to our country.

I repeat, I am in favor of the proposed radio bill, and hope that adequate appropriations will be made to enforce it after passage.

Respectfully,

THE AMERICAN RADIO RELAY LEAGUE,  
HIRAM PERCY MAXIM, President.

I also have here a communication from Mr. Stewart, the chairman of the Wireless Association of Pennsylvania. He was here the other day but was called away and may not be able to get back. I

told him in the event he could not return I would have this statement incorporated in the record, if there is no objection.

Mr. ROWE. Suppose we wait, before putting his statement in the record, until we see whether he can appear personally.

The CHAIRMAN. I think he may have some suggestions to make about the bill, if he comes. If he does not, I will put his statement in the record later on.

Mr. GREENE. Have the proponents of the bill said all they desire?

Commander TODD. Yes. I regret that the Bureau of Standards and the State Department could not be represented.

The CHAIRMAN. Those opposed to the bill, or who may criticize some of its provisions and suggest amendments are to be heard beginning to-morrow and the proponents will have an opportunity to be heard in rejoinder.

Commander TODD. I had hoped that the State Department representative could have been heard before the end, but I have given him up. What he had to say has no relation whatever to what any opposition may develop. His statement should be entirely from the broad viewpoint of what we are trying to bring about, the safety of the country and the proper political relations with our neighbors as affected by this question.

The CHAIRMAN. I have a telegram from the representative of the Mutual Telephone Co., of Hawaii. They have a station at Honolulu, and they have an interisland wireless system. One of their representatives called on me the other day and said they were sending a representative here to be heard, but it would take 10 or 12 days for him to arrive. That was some time early last week. I told him to go ahead and get him here, and he said he would arrive by the 25th. Of course, I assume we will be glad to hear from him when he comes.

Mr. GREENE. When do you propose to begin the hearing for the opponents of the bill?

The CHAIRMAN. To-morrow. Now, here are some telegrams. The first is dated New York, January 17, from the Kilbourne & Clark Manufacturing Co., as follows:

Mr. J. W. ALEXANDER,

*Chairman Committee on the Merchant Marine, Washington:*

I wish to indorse and urge the passage of H. R. 19350, now pending in the House of Representatives. I believe that this bill as drawn will work out satisfactorily and to the best interest of all concerned. I most heartily approve of sections 5 and 6. My firm is engaged in the manufacture and installation of radiotelegraph equipment.

Are they manufacturers of radio apparatus?

Commander TODD. Yes, sir; they equip ships and coastal stations.

The CHAIRMAN. Another telegram, dated New York, January 11, 1917, addressed to Hon. Joshua W. Alexander, etc., as follows:

The maritime association of the port of New York heartily indorses H. R. 19350, to regulate radio communications, and strongly urge its passage. The naval-communication service is of inestimable value to shipping in general, and Congress should encourage use of same by permitting all naval radio stations to accept business from any ship regardless of radio system employed.

The telegram is signed Joseph B. Morrell, president.

Also a telegram from New York, dated January 10, 1917, addressed to me, from the Union Sulphur Co., traffic department, as follows:

Referring to the pending bill for radio matter in which is involved the question of opening all radio stations to general public service, we wish to emphati-

cally state that we favor the opening of such stations, as we feel it is a step in the right direction and would be of great benefit to American shipping. We would be very glad to have you convey this information to your committee.

Then, here is a letter from the Attorney General, which I do not think it is worth while to put in the record. I will read it to the committee, however. Of course, they had a representative on the inter-departmental committee, and he perhaps helped to frame the neutrality provision.

Commander Todd. Yes, sir; and principally in connection with the legal phraseology of the bill.

The CHAIRMAN. Here is a letter from the Luckenbach Steamship Co., of New York, dated January 13, 1917, reading as follows:

Your circular letter of the 8th instant, inclosing H. R. 19350, to regulate radio communication, is acknowledged.

We regret we will be unable to attend the hearing on this bill. At the same time, we are heartily in favor of any measures which will improve the handling of our radio business, and we believe it would be better if all shore stations were in charge of the Government, as this would obviate the possibility of messages being blocked or jammed by coast stations belonging to different owners than those of the ships' stations.

The letter is signed by H. P. Hamilton, general manager.

Another letter from the Atlantic Communication Co. (Telefunken system of wireless telegraphy), 90 West Broad Street, New York City, addressed to Hon. Joshua W. Alexander, etc.:

DEAR SIR: Your recent favor was duly received.

Owing to the fact that a majority of the stockholders of this company are not accessible, it is impossible to call a meeting and have them express an opinion. The officers and directors of this company, however, all of whom are American citizens, feel that Government control of wireless telegraphy will eventually become a necessity, the more so as such control has been established in most foreign countries.

We further wish to state that it has always been the attitude of this company to cooperate cheerfully with the Government in every way, which will undoubtedly be confirmed by the officers of the Navy Department.

We thank the committee for the invitation to present our views, but feel that we could not state them more explicitly by appearing at the present time.

Yours, respectfully,

H. W. METZ, President.

Dr. N. G. FRANK, Secretary and Treasurer.

They are regular bank cashiers.

Commander Todd. I would like to call attention to the fact that that company is the owner of the Sayville station which is now communicating with Germany.

The CHAIRMAN. I had heard that statement made, but I did not know it as a fact.

Commander Todd. That is a fact. They are the owners of the Sayville station.

The CHAIRMAN. Let the record show the fact that the Atlantic Communication Co. is the owner of the Sayville station.

Commander Todd. Which is one of the most efficient of the high-powered stations in the country.

The CHAIRMAN. Then there is a letter from Richard Pfund, special radio apparatus, 111 Broadway, New York, dated January 10, 1917, addressed to me as chairman of the committee, he says:

Thank you for your favor of the 8th instant and the inclosed copy of H. R. 19350, to regulate radio communication, and I regret that I shall hardly be able to attend the hearings on this measure, because I am very busy with some appa-

status for the Signal Corps, upon which I am away behind on account of existing conditions.

I consider the proposed regulations most necessary, and not only for the proper conduct of radio communication in the United States, but also for the future safety of the country, and am absolutely unable to agree with those interests who are so strenuously opposing them, through various channels, and for one flimsy reason or another. Those loudest in their opposition, I have very excellent reasons for believing to be opposed solely because of their more or less direct, and more or less secret alliance with the foreign interests, who, in the guise of an American corporation, and in the guise of a commercial station, actually planted a high-power station on United States soil, and similar stations elsewhere in this hemisphere under other pretexts, which stations were primarily intended to serve a military purpose, and a by no means friendly purpose.

I am also absolutely unable to agree with the statement that these regulations would "stifle" wireless telegraphy in the United States, but believe that, among other benefits, they would also help to very "effectively stifle" the permanent separating of a multitude of small and inexperienced investors from their hard-earned savings, to be squandered in miscellaneous sinecures and unnecessary and antique stations for which there is no real demand or reasonable chance of return.

I sincerely hope that your honorable committee will be able to see its way clear to recommending the passage of this highly desirable and highly meritorious bill.

Very truly, yours,

RICHARD PFUND.

Also a letter from the Southern Pacific Co., dated New York, January 13, 1917:

DEAR SIR: Beg to acknowledge receipt of your letter dated January 8, 1917, concerning hearings to be held by the Committee on the Merchant Marine and Fisheries, on H. R. 19350, to regulate radio communication.

This company is interested in the measure, but will not be represented at the hearings, and I am, therefore, giving you an expression of our views on the subject, as suggested in your letter.

Under our present arrangement with the wireless company, which owns and operates adequate shore stations, we have unrestricted communication between ships and shore stations on official business of the company, enabling us to communicate with our ships, and they, in turn, can communicate with owners without charge.

It occurs to me that in the event the Government took over all wireless stations we would be denied the privilege, and be compelled to pay tolls on all official messages between ships and shore stations relating to strictly company business.

This is one objection to the bill, and if it will not mean the revocation of such privileges, or that shipowners' messages will be sidetracked for Government business, there will be no opposition on our part to its passage.

There are some other features that may cause some trouble for the ship-owners, particularly the supplying of wireless operators and necessity of purchasing our own wireless equipment, in all probability creating an increase in cost of wages for wireless operators.

Yours truly,

C. W. JUNGEN.

I would also like to place in the record the following letter from the Kilbourne & Clark Manufacturing Co., manufacturers of electrical apparatus:

SEATTLE, U. S. A., January 12, 1917.

Hon. J. W. ALEXANDER,

*Chairman Committee on The Merchant Marine and Fisheries,  
House of Representatives, Washington, D. C.*

SIR: In response to your favor of the 8th instant, including a printed copy of H. R. 19350, a bill to regulate radio communication, we are pleased to advise you as follows:

We are in favor of the passage of this bill without amendment. We believe that, if it becomes a law, progress in the art of radio communication will be

greatly accelerated because of either greater governmental control or complete administration of coastal radiotelegraph stations. We are of the opinion that closer supervision of such stations by the Government is of vital importance in the process of creating a greater American merchant marine; aside from the fact, which should be undisputed, that national supervision, or outright ownership is desirable for military reasons.

We are engaged in the manufacture of radiotelegraph apparatus and sell our product outright to shipowners. It is of interest to us and our customers to know that ships equipped with independent radiotelegraph sets shall at all times be able to communicate upon equal terms with any other radiotelegraph station either afloat or ashore.

From the standpoint, at least, of all shipowners who own and operate their own radiotelegraph equipment, and of all manufacturers thereof, who sell their apparatus and are not engaged in its operation, there can be no doubt as to the desirability of the enactment of this law.

Very respectfully,

KILBOURNE & CLARK Mfg. Co.,  
By FRED'K G. SIMPSON,  
Treasurer and General Manager.

Also the following telegrams:

SEATTLE, WASH., January 18, 1917.

MERCHANT MARINE AND FISHERIES COMMITTEE,  
Office Building, Washington, D. C.:

As a company who operates its own radio apparatus aboard steamships, we approve and respectfully urge for passage radio bill H. R. 19350.

PUGET SOUND TUGBOAT Co.

SEATTLE, WASH., January 18, 1917.

MERCHANT MARINE AND FISHERIES COMMITTEE,  
Office Building, Washington, D. C.:

Owning and operating our own vessels in the fishing trade, some equipped with wireless, we respectfully urge the passage of radio bill H. R. 19350.

SAN JUAN FISHING & Pkg. Co.

TACOMA, WASH., January 18, 1917.

MERCHANT MARINE AND FISHERIES COMMITTEE,  
Office Building, Washington, D. C.:

We strongly approve and respectfully urge for passage radio bill H. R. 19350.

PACIFIC STEAMSHIP Co.,  
H. F. ALEXANDER, President.

SEATTLE, WASH., January 18, 1917

MERCHANT MARINE AND FISHERIES COMMITTEE,  
House Office Building, Washington, D. C.:

We strongly approve and respectfully urge for passage radio bill, H. R. 19350.

ALASKA STEAMSHIP Co.

SEATTLE, WASH., January 18, 1917

MERCHANT MARINE AND FISHERIES COMMITTEE,  
Office Building, Washington, D. C.:

As a company who operates its own radio apparatus aboard steamships, we approve and respectfully urge for passage radio bill, H. R. 19350.

BOOTH FISHERIES Co.

I do not understand this bill interferes in any way with the privilege of buying equipment from anybody they please.

Commander Todd. It does not, sir.

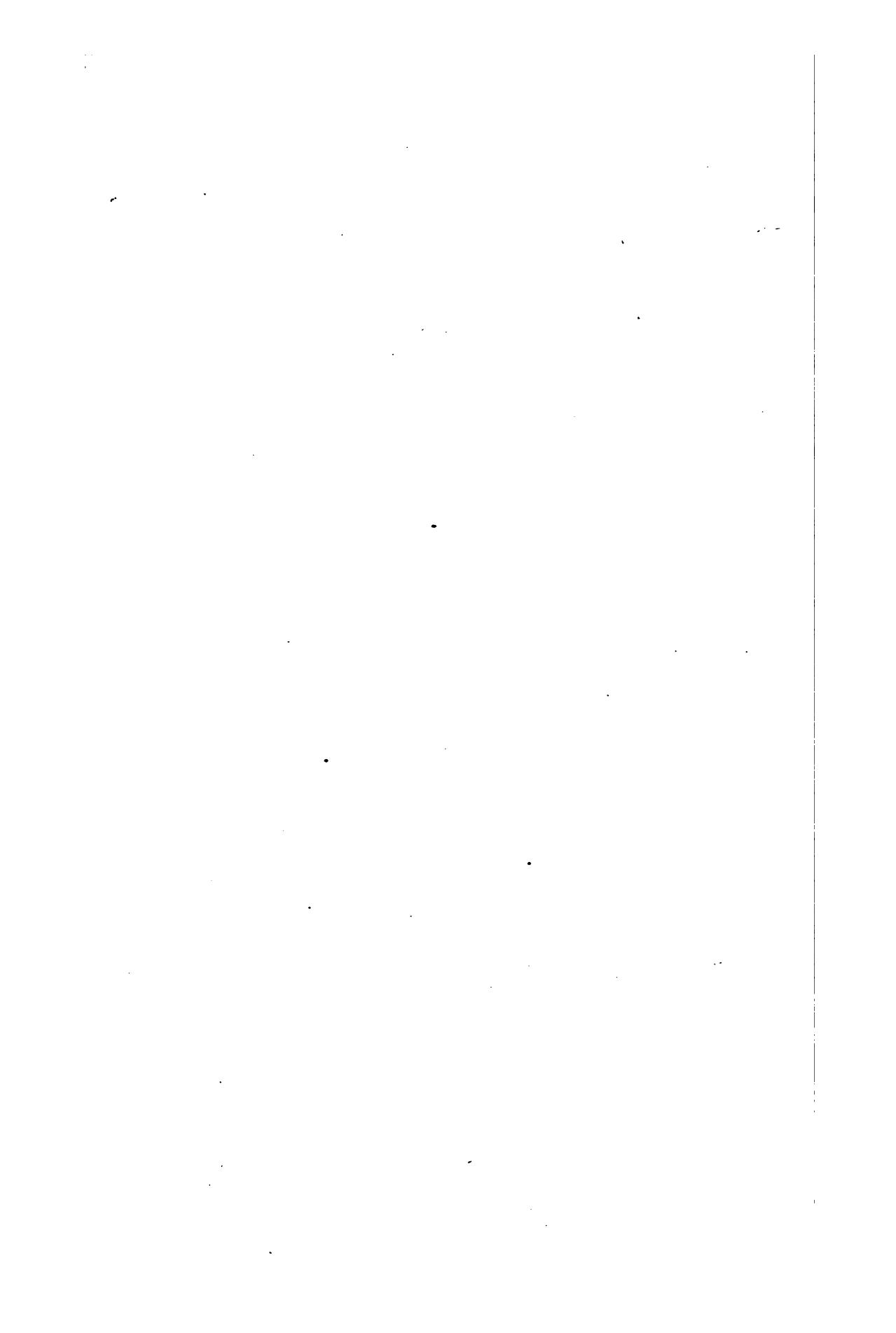
The CHAIRMAN. They have a monopoly now, I suppose, and do not desire to give it up; they have certain contracts which they do not care to give up.

Commander Todd. They have contracts with the Marconi Co., which company furnishes the apparatus and operators on a rental basis.

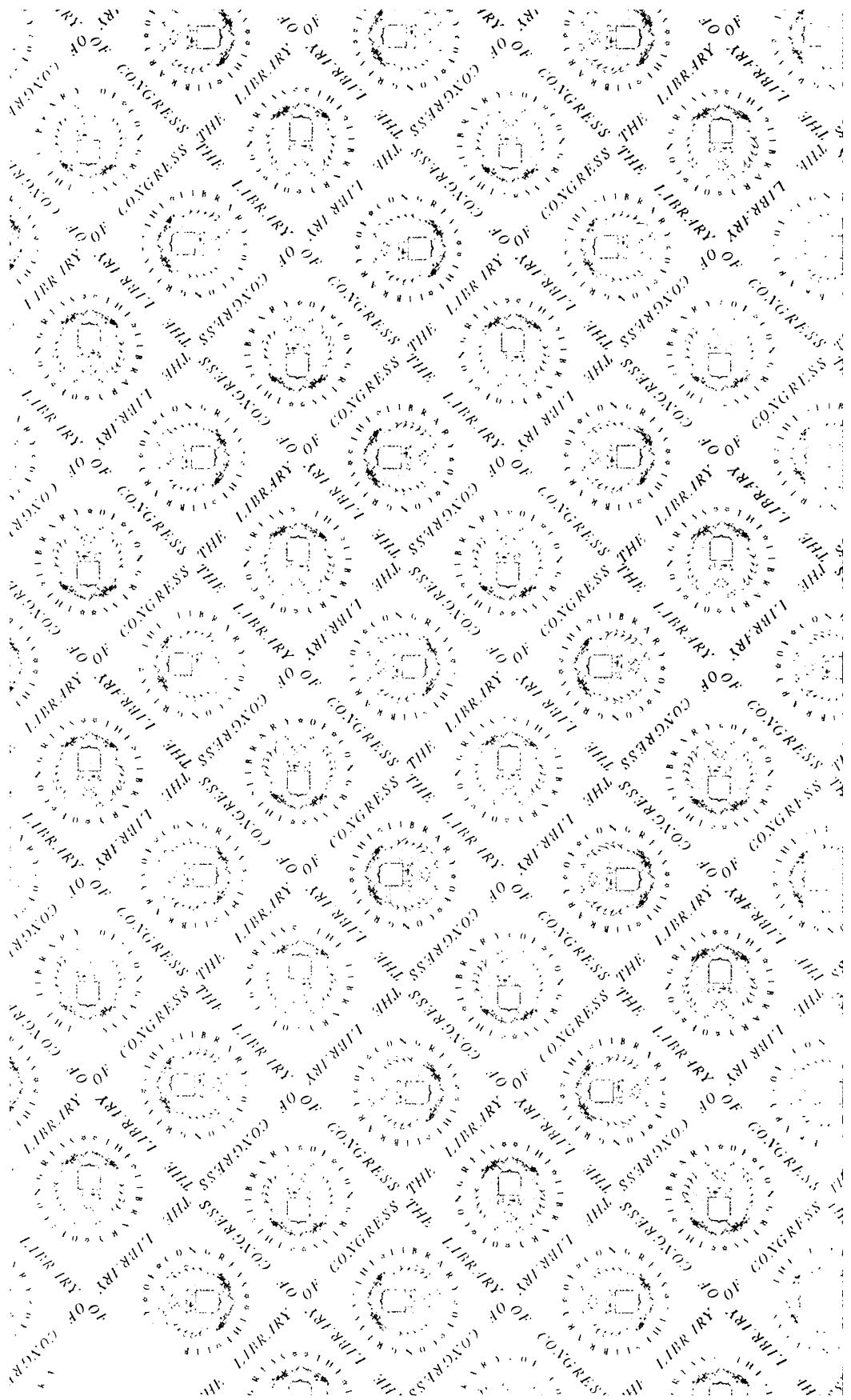
The CHAIRMAN. That is all I have at this time, except a letter from two professors of Columbia University. One will be here to-morrow and one the day following.

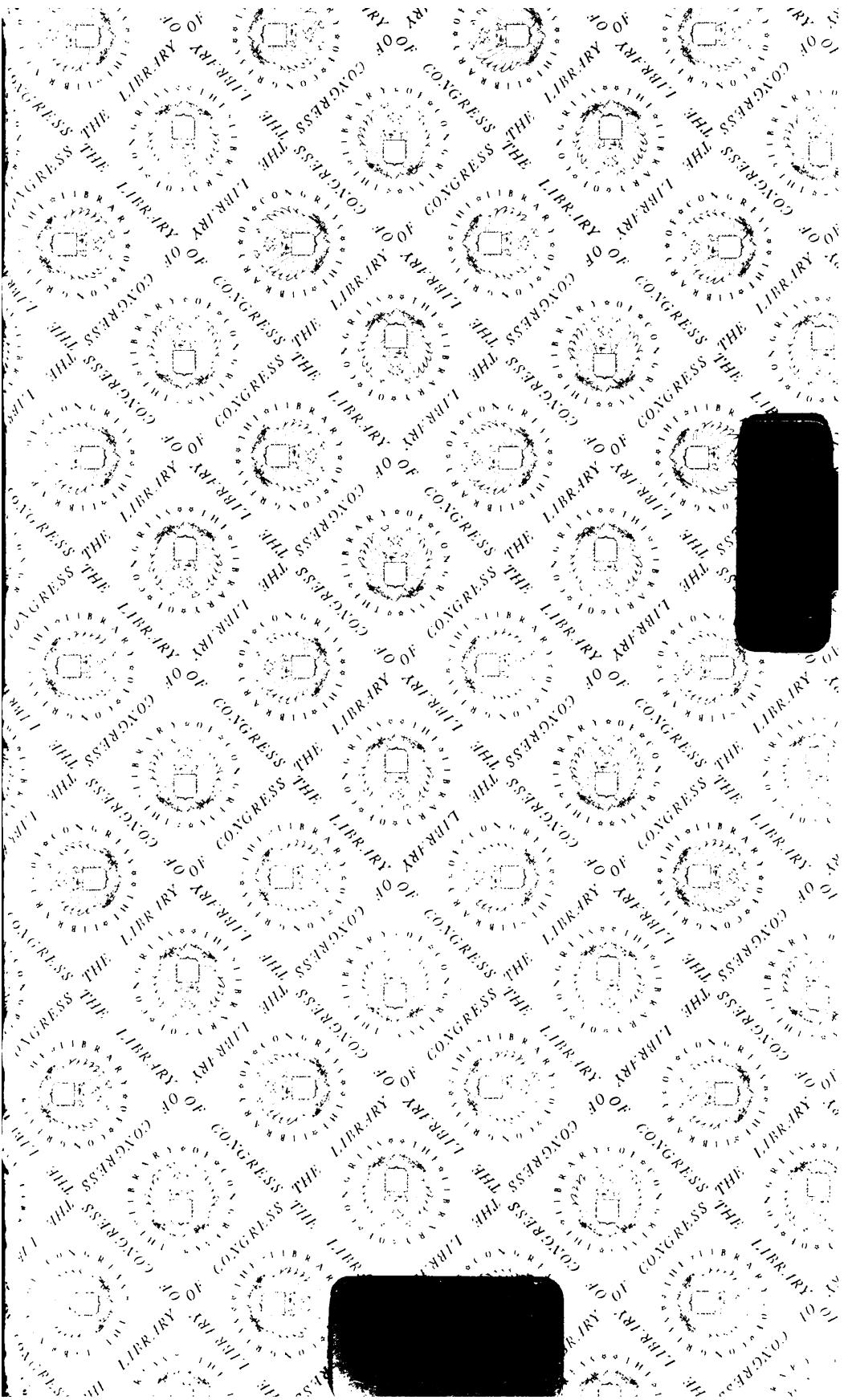
(The committee thereupon adjourned until to-morrow, Thursday, January 18, 1917, at 10.30 o'clock a. m.)











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